Progress towards Federated Logistics through the Integration of TEN-T into A Global Trade Network

D1.6 Legislation and EU Policy to impact EGTN v1

Document Summary Information

Grant Agreement No	860274	**Acronym**	PLANET
Full Title	Progress towards Federated Logistics through the Integration of TEN-T into A Global Trade Network		
Start Date	01/06/2020	**Duration**	36 months
Project URL	www.planetproject.eu		
Deliverable	D1.6 Legislation and EU Policy to impact EGTN v1		
Work Package	WP1		
Contractual due date	31/08/2021	**Actual submission date**	31/08/2021
Nature	Report	**Dissemination Level**	Public
Lead Beneficiary	UIRR		
Responsible Author	UIRR		
Contributions from	CERTH (co-author)		

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No 860274.

Revision history (including peer reviewing & quality control)

Version	Issue Date	% Complete[1]	Changes	Contributor(s)
1.0	15/09/20	10%	Initial Deliverable Structure	Eric Feyen (UIRR) Orestis Tsolakis (CERTH)
1.1	28/05/21	10%	Review deliverable structure + first input on chapter 5	Eric Feyen (UIRR) Orestis Tsolakis (CERTH)
1.2	28/07/2021	60%	Chapters 2 & 3 Chapters 4.1, 4.2, 4.3 Chapter 5 (all sections)	Eric Feyen (UIRR) Orestis Tsolakis (CERTH) Dr. Georgia Ayfantopoulou (CERTH)
1.3	29/07/2021	85%	Quality review (lay-out) Finalisation chapter 4 Updates chapter 5	Eric Feyen (UIRR) Orestis Tsolakis (CERTH)
1.4	03/08/2021	100%	Finalisation chapters 6 and 7 + executive summary + annexes + general lay-out + final quality review	Eric Feyen (UIRR) Orestis Tsolakis (CERTH)
1.5	31/08/2021	100%	Integration of peer review and quality control	Eric Feyen (UIRR) Orestis Tsolakis (CERTH)

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Table of Contents

List of Figures

List of Tables

Glossary of terms and abbreviations used

Abbreviation / Term	Description
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road
AGC	European Agreement on Main International Railway Lines
AGTC	European Agreement on Important International Combined Transport Lines and Related Installations
AI	Artificial Intelligence
ATP	Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage
B2A	Business to Authority
B2B	Business to Business
BPM	Business Process Model
CCAM	Connected, Cooperative and Automated Mobility
CIM	Contract of International Carriage of Goods by Rail
CIT	International Rail Transport Committee
CIV	Contract of International Carriage of Passengers by Rail
CNC	Core Network Corridors
COTIF	Convention concerning International Carriage by Rail
CSRD	Corporate Sustainability Reporting Directive
CT	Combined Transport
CUI	Contract of use of infrastructure in international rail traffic
CUV	Contract of use of vehicles in international rail traffic
DTLF	Digital and Transport Logistics Forum
EC	European Commission
e-FTI	electronic Freight Transport Information
EGTN	Integrated Green EU-Global T&L Networks
EGTN	Green EU-Global Trade & Logistics Networks
EMSWe	European Maritime Single Window environment
EO	Economic Operators
ERTMS	European Rail Traffic Management System
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GTC	General Terms and Conditions
ICT	Information and Communications Technology

IMO	International Maritime Organisation
IRU	International Road Transport Union
ITS	Intelligent Transport Systems
KPI	Key Performance Indicator
MB	Management Board
MMT	Multi Modal Transport Reference Data Model
NFRD	Non-Financial Reporting Directive
OSJD	Organisation for co-operation between railways
OTIF	Intergovernmental Organisation for International Carriage by Rail
PI	Physical Internet
RAG	Rail Advisory Group
REFIT	Regular Fitness and Performance Programme
RFC	Rail Freight Corridor
RID	Contract of International Carriage of Dangerous Goods by Rail
RNE	RailNet Europe
SMEs	Small and Medium-sized Enterprises
SMGS	Agreement on Direct International Goods Transport by Rail
SMGS	Agreement on International Railway Freight Communications
SMPS	Agreement on Direct International Carriage of Passengers and Luggage by Rail
T&L	Transport & Logistics
TAG	Terminal Advisory Group
TCO	Total Cost of Ownership
TDM	Transport Data Model
TEN-T	Trans-European Transport Network
TIR	International Road Transports
TSIs	Technical Specifications for Interoperability
UN	United Nations
UN/CEFACT	The United Nations Centre for Trade Facilitation and Electronic Business
UNECE	United Nations Economic Commission for Europe
VTMISS	Vessel Traffic Monitoring and Information Systems
WCO	World Customs Organisation

1 Executive Summary

This deliverable D1.6 on 'Legislation and EU Policy to impact EGTN' addresses the results of the analysis of ongoing and forthcoming legislative and policy initiatives that might impact the design and realisation of the EGTN within the PLANET project.

The research on legislative initiatives focuses on the impacts of international and EU initiatives (national level will be covered in the final version of the deliverable). For both levels, the consortium has identified actions that regulate topics such as infrastructure, greening of transportation, digitalisation, operations and intermodal (modal shift). All these measures might affect at least one of the EGTN dimensions (infrastructure, technology and governance). Most of the inventoried initiatives are impacting the infrastructure components and operations of the EGTN whereas some actions concentrated on the governing rules and on the digitalisation of transport-related documents (consignment note, customs). The first preliminary impact assessment demonstrates that nearly the entire catalogue is EGTN-relevant and will influence the EGTN attributes (Geo-economics aware, Innovation, Impact, Integrated, Inclusive).

The review of policy initiatives concentrated on the activities carried out under the Digital Transport & Logistics Forum (DTLF), the recently published Sustainable and Smart Mobility Strategy and the Sustainable Finance (EU taxonomy) policy. For the DTLF, the impacts of the e-FTI Regulation (as part of the group 1 on paperless transport) and of the development of federated platforms on the EGTN have been analysed and evidences show a clear impact of those policies on the realisation of the EGTN.

For both aspects (legislative and policy initiatives), a preliminary selection of impacts to be fed into PLANET simulation models has been identified and can be handed over to the partners in charge of these models. It is also recommended to share the outputs of this analysis to the coordinators of the three living labs for further analysis and validations (in particular for the review of national legislative and policy initiatives).

The key implementation barriers per legislation and/or per EGTN dimension have proven that a full interoperable EU network does currently not exist and that additional actions need to be undertaken to achieve the initial objectives of the TEN-T or Rail Freight Corridor Regulation. All preconditions for a solid EGTN foundation have also been identified and could be used as part of the policy recommendations to be drafted within work package 5 of PLANET.

2 Introduction

The vision of PLANET is to advance the European Commission's strategy for Smart, Green and Integrated Transport and Logistics by efficiently interconnecting infrastructure (TEN-T, Rail-Freight Corridors) with geopolitical developments, as well as to optimise the use of current & emerging transport modes and technological solutions. The realization of this vision is what PLANET calls the **Integrated Green EU-Global T&L Networks (EGTN)**.

The main objective of the first version of this deliverable is to evaluate the potential impacts of various legislative and policy initiatives on the EGTN implementation and to assess the key implementation barriers.

- For the legislative actions, the international and European legislative initiatives have been considered as a first step. The catalogue has been compiled with the support of the project partners and experts from various national, European and international associations (such as CIT, IRU, OTIF…). The impacts and barriers have been identified based on desktop research, existing impacts assessments performed by authorities such as European Commission and position papers of various associations active in the freight sector.
- For the policy initiatives, the inventory was created based on the activities performed by the DTLF subgroup 1 (paperless document) and 2 (corridor information systems) and the active participation to these groups by various project partners. The impacts and barriers have been collected mainly thanks to the results of a qualitative survey among the consortium and some additional external partners.

2.1 Mapping PLANET Outputs

Purpose of this section is to map PLANET's Grant Agreement commitments, both within the formal Deliverable and Task description, against the project's respective outputs and work performed (see table 1).

Table 1: Adherence to PLANET's GA Deliverable & Tasks Descriptions

PLANET GA Component Title	PLANET GA Component Outline	Respective Document Chapter(s)	Justification
DELIVERABLE			
D1.6 Legislation and EU policy to impact EGTN v1	Analysis and impact assessment of forthcoming international, EU and national legislative initiatives and EU policy on the development of EGTN including key barriers and drivers.	Chapters 4, 5, 6 and 7	Chapter 4 describes the legislative environment whereas chapter 5 details the policy developments. Chapter 6 describes the potential policy recommendations and chapter 7 includes the key barriers and drivers for both legislative and policy aspects.
TASKS			
ST1.3.1 Analysis and preliminary impact assessment of forthcoming international, EU and national legislative initiatives on the	The analysis will focus on the main legislative initiatives at international, EU and national level that could have a significant impact on the realisation of the EGTN. The work to be undertaken will include the following steps:	Sections 4.1 to 4.5 + chapter 6	Section 4.1 lists the initiatives on International (partially) and European (all) levels. The final version will include the national initiatives. Section 4.2 highlights the most relevant legislative initiatives for the EGTN development.

development of the EGTN	1. Provision of legislation factors to be considered in T1.1 2. identification of forthcoming international, EU and national legislative initiatives that could impact the development of the EGTN, using experts' focus groups 3. preliminary qualitative assessment of the impact of each initiative on the EGTN's attributes as defined in section 1.3.1 and the LLs using experts' focus groups 4. prioritisation of the forthcoming legislative initiatives and selection of the ones to be used in Task T1.5		Section 4.3 includes a preliminary qualitative assessment of the impacts Section 4.4 provides a selection of impacts to be fed into simulation Section 4.5 lists the impacts translated into Reference Specifications for EGTN realization Chapter 7 includes the legislative recommendations.
ST1.3.2 Analysis and preliminary impact assessment of EU policy initiatives affecting EGTN with particular reference to DTLF	The analysis will focus on the main EU policy initiatives that could have a significant effect on the realisation of the EGTN, and which have not yet been translated into a specific legislative proposal. The DTLF II initiative is expected to serve as the focus of this Task by participants in both DTLF II subgroups (e.g. INLECOM, UIRR, CERTH, VPF). The work to be undertaken will include the following steps: 1. identification of potential future EU policy actions that could impact the development of the EGTN, drawing from the ongoing DTLF results (especially from SG2 on optimising cargo flows along transport corridors) 2. preliminary qualitative assessment of the impact of each potential future policy initiative on the EGTN's attributes as defined in section 1.3.1 using experts' focus groups	Sections 5.1 to 5.5 + chapter 6	Section 5.1 lists all policy initiatives. Section 5.2 highlights the most relevant policy initiatives for the EGTN development. Section 5.3 includes a preliminary qualitative assessment of the impacts Section 5.4 provides a selection of impacts to be fed into simulation Section 5.5 lists the impacts translated into Reference Specifications for EGTN realization Chapter 7 provides the first preliminary legislative and policy prerequisites for the EGTN realisation.

	3. prioritisation of the potential future policy initiatives and selection of the ones to be used in T1.5		
ST1.3.3 List of key barriers arising from relevant legislation and policies	This task will define the key implementation barriers faced by the prioritised forthcoming legislative initiatives (Subtask 1.3.1) and potential future policy initiatives (Subtask 1.3.2): 1. identification of implementation barriers for each one of the prioritised legislative and policy initiatives 2. semantic alignment, removal of duplicate barriers and definition of final barriers' list 3. classification of barriers according to the main EGTN attribute they have an impact on (i.e. geo-economics aware, innovation embedding, impactful, integrated, inclusive) 4. linkage of each barrier to the main recommendation categories foreseen in WP4 (i.e. TEN-T Interfacing to Global trade routes – Task 4.1, guide on disadvantaged regions – Task 4.2, capacity building programmes – Task 4.3, technology roadmaps – Task 4.4, standardisation – Task 4.5.	Sections 6.1 and 6.2	Sections 6.1 and 6.2 details the barriers and their classification whereas section 6.3 points out the relevance for the other WPs and LLs.

2.2 Deliverable Overview and Report Structure

Figure 1 represents graphically the main elements of this deliverable. Besides the usual parts as the executive summary and the introductive words, this document summarises the concept of EGTN (definition and possible impacts) as envisaged by the PLANET project partners. The core part of the document is the impact assessment of the selected relevant legislative and policy initiatives that might influence the design and realisation of the EGTN. The key implementation barriers of those actions are also included in this deliverable.

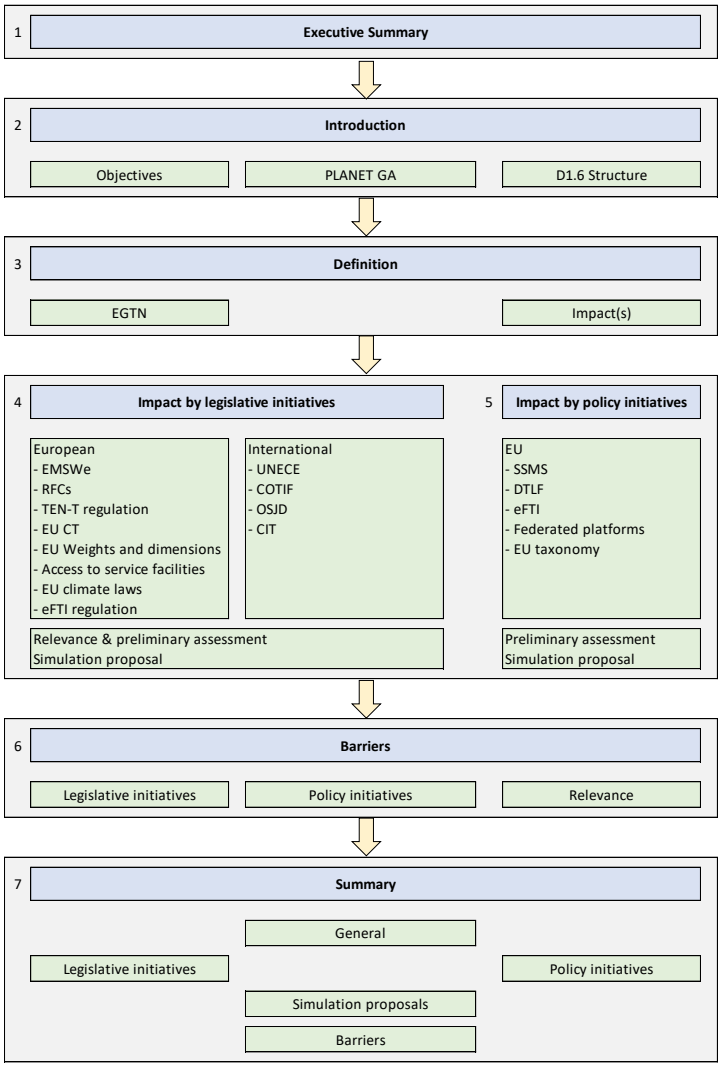

Figure 1: D1.6 structure

Based on the figure 1, the deliverable v1 has been structured in seven distinctive chapters:

- Chapter 1 includes the executive summary.
- Chapter 2 introduces the general objectives of the study on legislative and policy actions
- Chapter 3 describes the definition of EGTN in the context of the PLANET project and of the potential impacts of legislative and policy initiatives on the development of the EGTN.
- Chapters 4 and 5 detail the impacts of respectively the legislative and policy initiatives on the EGTN
- Chapter 6 summarises the key implementation barriers faced by the legislative and policy initiatives
- Chapter 7 includes a preliminary list of prerequisites for the EGTN realisation

3 EGTN and impact definition

3.1 The EGTN concept in PLANET

The vision of PLANET is to advance the European Commission's strategy for Smart, Green and Integrated Transport and Logistics by efficiently interconnecting infrastructure (TEN-T, Rail-Freight Corridors) with geopolitical developments, as well as to optimise the use of current & emerging transport modes and technological solutions, while ensuring equitable inclusivity of all participants, increasing the prosperity of nations, preserving the environment, and enhancing Citizens quality of life. The realization of this vision is what PLANET calls the **Integrated Green EU-Global T&L Networks (EGTN)**.

Therefore, EGTN are international logistics systems that:

- make use of physical and digital infrastructures;
- aim at operational excellence for customers and external stakeholders;
- incorporate geo-economic context;
- are enabled by (disruptive) transport & logistics concepts and technologies.

The **EGTN attributes** are:

- Geo-economics aware: A European T&L network that is aware of the geo-economics aspects driving the development of new trade routes and flows to/from Europe and their impact on the TEN-T;
- Innovation: A European T&L network that takes advantage of the potential of innovative logistics concepts (e.g. PI) and enabling technological innovations (Industry 4.0, blockchain, IoT, 3D printing, etc.) in its operation;
- Impact: A T&L network that is more economically, environmentally and socially sustainable than the existing TEN-T;
- Integrated: An EU T&L network integrated with the global network both in terms of hard & soft infrastructure;
- Inclusive: Accessible to disadvantaged regions, supporting the development of workforce skills & knowledge.

To satisfy the above attributes PLANET goes beyond strategic transport studies and also beyond transport ICT research, by rigorously modelling, analysing and assessing T&L interactions and dynamics. The aim is to generate and exercise the most important future scenarios from a T&L perspective. The EGTN technology workstream is not aimed at producing a 'platform' but instead focuses in a blueprint and best practices to help T&L actors to define and implement a clear digital strategy.

The development of EGTN in PLANET encompasses a three-layer structure: **physical**, **technological** and **governance dimensions**.

- The physical infrastructural layer of EGTN is defined as the TEN-T of the future in terms of T&L infrastructure. It consists of the revised and enriched existing rail/road/maritime TEN-T infrastructure (nodes & corridors) as a result of the new emerging routes which alter the significance of existing infrastructure and the criticality of current capacity bottlenecks, causing also the emerge of new important nodes/corridors. The EGTN is connected and operationally integrated to the new global corridors while at the same time the regional dimension of infrastructure will be enhanced in order to facilitate the development of disadvantaged regions.
- The technology layer of EGTN consists of the digital infrastructure of EGTN which aims to realize the innovation attribute of EGTN through leveraging emerging technologies and supporting its operation under the PI paradigm. In order to be able to do so, an open, cloud-based EGTN infrastructure will be developed in the form of an online platform to support the planning of EGTN, meet its management requirements and also facilitate its governance.
- The governance layer of EGTN consists of the ecosystem of stakeholders interacting and collaborating for developing and sharing T&L infrastructure and participating in the decision making

of the EGTN. It also includes all the corridor governing schemes which will be developed within EU or between EU and non-EU countries as well as a possible overarching governance scheme similar to the concept of Single European Sky (SES) which delegated competences in air traffic management (ATM) to the EU and the decision-making process has moved away from an intergovernmental practice to the EU framework.

3.2 How legislative and policy initiatives could impact to EGTN

In the context of task 1.3, the main aim is (1) to create an inventory of all legislative and policy initiatives and (2) to perform a first preliminary impact assessment of those relevant actions for the EGTN developments.

Legislation is a "*law which has been promulgated (or "enacted") by a legislature or other governing body or the process of making it"* whereas policy can be defined as "*a set of ideas or a plan of what to do in particular situations that has been agreed to officially by a group of people, a business organization, a government, or a political party*".

- The **inventory related to the legislative initiatives** will focus on all acts taken by any governance bodies at international, EU and national level For the European Union, it means the analysis of EU treaties, Regulations, Directives, Delegated and Implementing Acts. The international catalogue will concentrate on set of rules, norms and standards generally recognised as bunding nations. It covers treaties and standardization committees. For national level, cases will be considered where differences at the implementation of EU legislation exist and the ones of the non-EU countries along the three emerging routes/corridors to/from Europe identified in Task 1.2.

- The **inventory related to the policy actions** will concentrate on the activities carried out under the Digital Transport & Logistics Forum (DTLF). The DTLF is a group of experts that brings together stakeholders from different transport and logistics communities, from both the private and the public sector, with a view to build a common vision and road map for digital transport and logistics. The DTLF also contributes to identifying needs for measures at EU level and supporting their development and implementation where relevant.

The second core elements of this activity is to evaluate the impacts of all the above-listed actions on the EGTN design and development. Impact assessments examine whether there is a need for action and analyse the possible impacts of available solutions. These are usually carried out during the preparation phase, before a governing body finalises a proposal for a new law or policy. They provide evidence to inform and support the decision-making process. In Europe, the findings are summarized in impact assessment reports which should contain at least the following elements: the environmental, social and economic impacts, including impacts on small and medium enterprises and competitiveness, and an explicit statement if any of these are not considered significant, who will be affected by the initiative and how the consultation strategy and the results obtained from it.

For this specific task, a first preliminary impact assessment of all identified legislative and policy actions will be undertaken.

4 Impact assessment of forthcoming legislative initiatives on the EGTN development

The analysis will consider forthcoming initiatives, i.e. initiatives that are either in an ongoing legislative process, or having completed the legislative process and there is an agreed date of coming into effect in the near future, or have been placed as a priority in forthcoming legislative action plans.

4.1 Inventory of forthcoming legislative initiatives

4.1.1 European level

Table 2 summarises all the identified forthcoming initiatives that are relevant for the development of the EGTN. At European level, 9 legislative actions have been listed. Most of them have been recently developed and updated (apart the Combined Transport Directive from 1992) and are covering a large variety of topics such as infrastructure (6x), greening (2x), digitalisation (5x), operations (4x) and intermodal transport (x7).

Table 2: Inventory of EU legislative initiatives

		TOPICS					
Name	**Coverage**	**Infrastructure**	**Greening**	**Digitalisation**	**Operations**	**Intermodal**	**Year**
Regulation (EU) 2019/1239 of the European Parliament and of the Council of 20 June 2019 establishing a European Maritime Single Window environment and repealing Directive 2010/65/EU	EU			x	x		2019
Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight Text with EEA relevance	EU	x		x	x	x	2010
Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU Text with EEA relevance	EU	x				x	2013
Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States	EU	x			x	x	1992
Regulation (EU) 2020/1056 of the European Parliament and of the Council of 15 July 2020 on electronic freight transport information (Text with EEA relevance)	EU			x		x	2020
Directive (EU) 2015/719 of the European Parliament and of the Council of 29 April 2015 amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic (Text with EEA relevance)	EU	x			x	x	2015
COMMISSION IMPLEMENTING REGULATION (EU) 2017/2177 of 22 November 2017 on access to service facilities and rail-related services	EU	x		x		x	2017
COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Sustainable and Smart Mobility Strategy – putting European transport on track for the future	EU	x	x	x	x	x	2020
Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law)	EU		x				2020

4.1.1.1 EMSWe

The EU legislation adopted in 2010 introduced National Single Windows for maritime transport but failed to reduce sufficiently administrative burden due to lack of harmonisation between the EU Member States. Total of 2.5 mi hours could be saved annually with more efficient electronic reporting procedures. The European Maritime Single Window Environment Regulation, known as EMSWe, was adopted in 2019 aiming at removing the barriers (diverse interfaces, diverse reporting requirements, reporting duplication…). The objectives of the new Regulation are (i) harmonised data (comprehensive and controlled data set), (ii) harmonised submission (system-to-system, graphical user interface, spreadsheets), (iii) re-use of information (port call, departure for arrival, common EU databases and (iv) clear governance (national coordinators, multiannual plan, powers to adapt). The implantation deadline is July 2025.

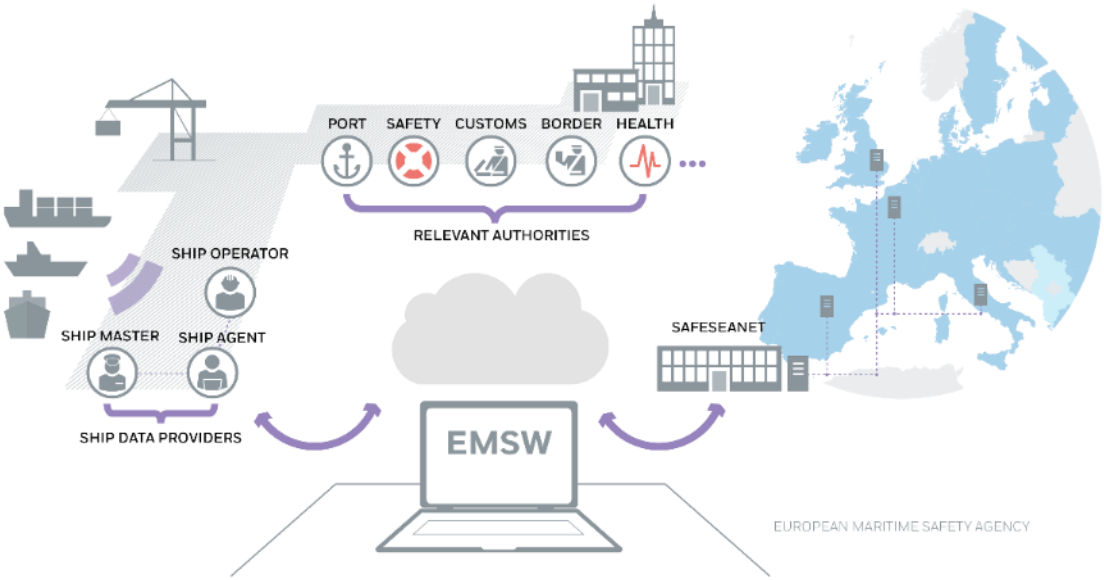

Figure 2: The European maritime single window environment

Source: European Maritime Safety Agency, European maritime single window environment, 2018

The EMSW prototype (see Figure 2) is the place where all information including the eManifest is reported and made available to various competent authorities in the different participating Member States. It covers the information flows between the ship data providers (e.g. ship agent, master, shipping company); the relevant public authorities covering the port of call, and Other Member States via SafeSeaNet.

4.1.1.2 Rail Freight Corridors

The Regulation concerning a European Rail Network for Competitive Freight (Regulation EU 913/2010) entered into force on 9 November 2010.

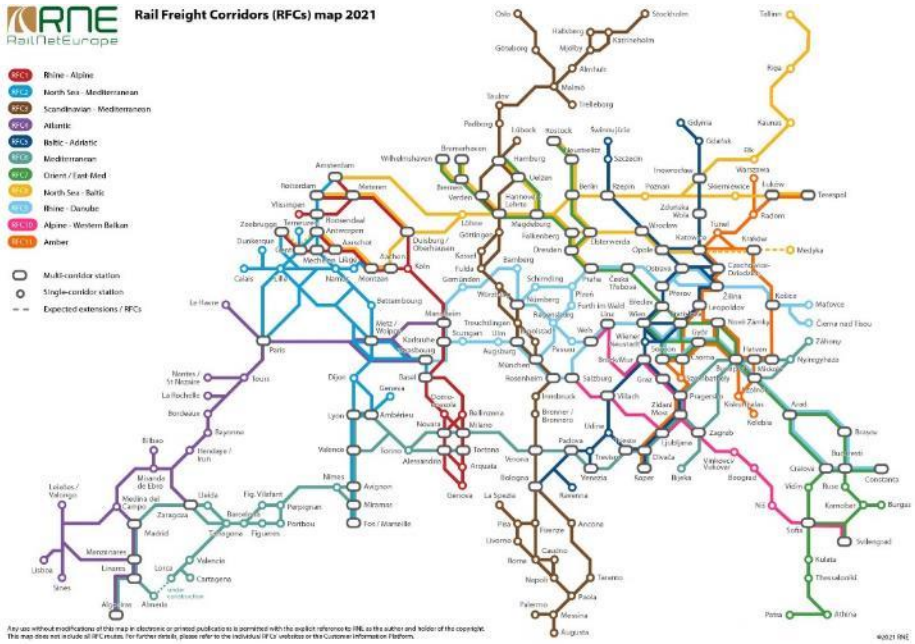

Figure 3: Map of rail freight corridors (source: RNE website)

The Regulation requests Member States to establish international market-oriented rail freight corridors (Figure 3 of the current 11 rail freight corridors) to meet three challenges:

- Strengthen co-operation between infrastructure managers on key aspects such as allocation of path, deployment of interoperable systems, and infrastructure development;
- Strike the right balance between freight and passenger traffic along the rail freight corridors, giving adequate capacity and priority for freight in line with market needs and ensuring that common punctuality targets for freight trains are met; and
- Promote intermodality between rail and other transport modes by integrating terminals into the corridor management and development.

The involvement of partners along the logistic chain is important to the management board of every RFC (i.e., Member States and IMs). On each RFC, specific advisory boards have been designed and created:

The Railway Advisory Group (RAG) represents a platform for railway undertakings to facilitate the exchange of information, recommendations, and mutual understanding about technical and operational issues of rail operators with the Management Board. UIC is responsible for the coordination of all RAG RFC speakers.

The Terminal Advisory Group (TAG) represents a platform for managers and owners of terminals and port authorities to facilitate the exchange of information or recommendations about technical and operational issues, respectively strategic plans for improvements with the Management Board. The TAG may issue an opinion on any proposal by the MB which has direct consequences for investment and the management of terminals. UIRR has been named as the coordinator of all TAG RFC speakers.

Article 19 (2) of Regulation (EU) 913/2010 concerning a European rail network for competitive freight requires the Management Boards of the RFCs to monitor the performance of rail freight services on their respective freight corridors and publish the results once a year.

To facilitate the fulfilment of the above obligation, in 2015, a joint RNE-RFC project team developed a first set of KPIs commonly applicable to all RFCs. These KPIs were included into the Guidelines 'Key Performance Indicators of Rail Freight Corridors'. The further development of commonly applicable KPIs was triggered by the Rotterdam Sector Statement of 2016. One of its priority projects was to monitor the quality of freight services by means of implemented and shared KPIs. To meet this requirement, the sector developed certain proposals and those which were proved feasible have been added to the set of commonly applicable RFC KPIs. The current set of commonly applicable KPIs is displayed in Figure 4.

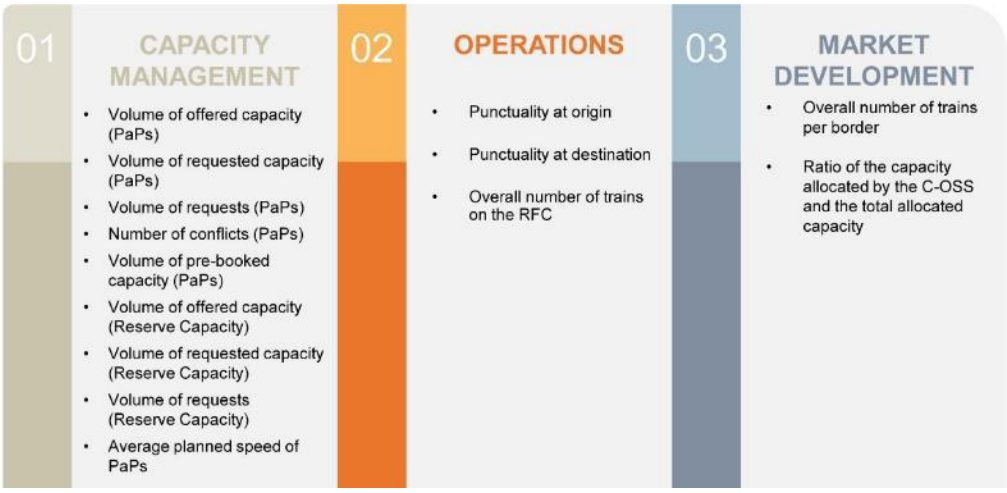

Figure 4: Common KPIs on the RFCs (source: RNE website)

4.1.1.3 TEN-T Regulation

The Trans-European Network (TEN) is an EU-defined high-level transport network and instrument for the standardization of transport systems. In the long term, cross-border connections are to be improved, weak links are to be national networks, and connecting peripheral regions and combining and interconnecting the different modes of transport through better interoperability. TEN is an umbrella term which summarizes the activities of the EU in the areas of the transport infrastructure (i.e., TEN-T), the telecommunications infrastructure, (i.e., e-TEN), and energy infrastructure (i.e., TEN-Energy).

TEN-T policy aims to develop and implement a Europe-wide network of railways, roads, inland waterways, maritime routes, ports, airports, and rail-road (i.e., intermodal) terminals. The objective is to close gaps, remove bottlenecks, and technical barriers as well as strengthen social, economic, and territorial cohesion in the EU. The current TEN-T policy is based on Regulation (EU) No 1315/2013. For TEN-T, the EU Commission envisages two network layers:

- Core network which includes most of the important connections, linking the most important nodes, with the goal of being completed by 2030; and
- Comprehensive network which covers all European regions with the goal of being completed by 2050.

Table 3 details the key TEN-T parameters per transport mode (rail, inland waterway, road, maritime). It includes all aspects of the core and comprehensive network.

Table 3: TEN-T parameters per transport mode

Transport Mode	TEN-T key parameters (core + comprehensive)
Rail **(section 1)**	(1) full electrification of the line tracks with as much siding as needed (2) at least 22,5 t axle load, 100 km/h line speed, and the possibility of running trains with a length of 740 m, (3) full deployment of ERTMS, and (4) a nominal track gauge for new railway lines of 1,435 mm. (4) The freight terminals and their respective first and last mile connections are listed as components of the railway infrastructure and are also connected with road infrastructure as part of the comprehensive network. They partake as nodes of the TEN-T core network if their annual transshipment of freight exceeds 800,000 tonnes for non-bulk cargo and 0.1% of the corresponding total annual cargo volume is handled. (5) Terminals shall be equipped with cranes, conveyors, and other devices to move freight between different transport modes.
Inland waterway **(section 2)**	(1) To be part of the comprehensive network, inland ports shall have an annual freight transhipment volume exceeding 500 000 tonnes. The total annual freight transhipment volume shall be based on the latest available three-year average, as published by Eurostat. (2) Member States shall ensure that inland ports are connected with the road or rail infrastructure. (3) Inland ports shall offer at least one freight terminal open to all operators in a non-discriminatory way and shall apply transparent charges. (4) rivers, canals and lakes comply with the minimum requirements for class IV waterways as laid down in the new classification of inland waterways established by the European Conference of Ministers of Transport (ECMT) and that there is continuous bridge clearance, without prejudice to Articles 35 and 36 of this Regulation. (5) rivers, canals and lakes are maintained so as to preserve good navigation status, while respecting the applicable environmental law; (6) rivers, canals and lakes are equipped with RIS.
Road **(section 3)**	(1) High-quality roads shall be specially designed and built for motor traffic, and shall be either motorways, express roads or conventional strategic roads. (2) Those roads shall be adequately maintained to allow safe and secure traffic. (3) Equipment associated with roads may include, in particular, equipment for traffic management, information and route guidance, for the levying of user charges, for safety, for reducing negative environmental effects, for refuelling or recharging of vehicles with alternative propulsion, and for secure parking areas for commercial vehicles. (4) road tunnels over 500 m in length comply with Directive 2004/54/EC of the European Parliament and of the Council (2); (5) where applicable, the interoperability of toll collection systems is ensured in accordance with Directive 2004/52/EC of the European Parliament and of the Council (3) and with Commission Decision 2009/750/EC;

	(6) any intelligent transport system deployed by a public authority on road transport infrastructure complies with Directive 2010/40/EU and is deployed in a manner consistent with delegated acts adopted under that Directive
Maritime and motorways of the sea **(Section 4)**	(1) Maritime ports shall be entry and exit points for the land infrastructure of the comprehensive network. (2) The total annual cargo volume – either for bulk or for nonbulk cargo handling – exceeds 0,1 % of the corresponding total annual cargo volume handled in all maritime ports of the Union. The reference amount for this total volume is the latest available three-year average, based on the statistics published by Eurostat; (3) Equipment associated with maritime transport infrastructure may include, in particular, equipment for traffic and cargo management, for the reduction of negative effects, including negative environmental effects, and for the use of alternative fuels, as well as equipment to ensure year-round navigability, including ice-breaking, hydrological surveys, and for dredging, maintenance and protection of the port and port approaches. (4) maritime ports are connected with railway lines or roads and, where possible, inland waterways of the comprehensive network, except where physical constraints prevent such connection; (5) any maritime port that serves freight traffic offers at least one terminal which is open to users in a non-discriminatory way and which applies transparent charges; (6) sea canals, port fairways and estuaries connect two seas, or provide access from the sea to maritime ports and correspond at least to inland waterway class VI. (7) Member States shall implement VTMIS and SafeSeaNet as provided for in Directive 2002/59/EC and shall deploy eMaritime services, including in particular maritime single window services, as provided for in Directive 2010/65/EU.

4.1.1.4 EU Directive on Combined Transport

Combined Transport is promoted within the European Union (EU) through the Combined Transport (CT) Directive (Council Directive 92/106/EEC). The Directive seeks to promote Combined Transport operations through the elimination of authorisation procedures and quantitative restrictions for Combined Transport operations, it clarifies the non-application of road cabotage restrictions on road legs, and provides financial support through fiscal incentives for certain Combined Transport operations. In order to be eligible for the provisions within the CT Directive, the movement of goods must meet a number of specific criteria as regards type of load units and distances.

The CT Directive is supported by other EU policies, such as the Weights and Dimensions Directive (Directive (EU) 2015/719 amending Council Directive 96/53/EC) which provides for Member States to permit movement of heavier intermodal load units by road when used in Combined Transport operations. Furthermore, the EU is also providing financial support for projects relating to combined transport.

In 2014, a study on EU combined transport market and two stakeholder consultations concluded that support for combined transport is perceived as very important by stakeholders in order to be able to support modal shift. The contributions received in the public consultation are summarised in a report. Based on the study, a REFIT (Regularly Fitness and Performance Programme) evaluation of the Combined Transport Directive is currently being finalised, with the outcome that it continues to be a relevant tool, however efficiency and effectiveness could be improved.

An amendment proposal was introduced by the Commission in November 2017 but decided to withdraw it due to extreme positions during the trialogue procedure. The European Commission adopted a package of

proposals to make the EU's climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. In the EU's roadmap a revised proposal for a Directive on Combined Transport has been scheduled for 2021.

4.1.1.5 Directive on Weights & Dimensions

In Europe, heavy goods vehicles, buses, and coaches must comply with certain rules on weights and dimensions for road safety reasons and to avoid damaging roads, bridges, and tunnels. Directive (EU) 2015/719 sets maximum dimensions and weights for international traffic, also ensuring that Member States cannot restrict the circulation of vehicles which comply with these limits from performing international transport operations within their territories.

The Directive also aims at avoiding that national operators benefit from undue advantages over their competitors from other Member States when performing national transport. These rules are complemented by the requirements for type-approval of commercial vehicles laid out in Regulation 2018/858 which sets the framework for putting vehicles such as light-duty and heavy-duty vehicles, buses, and trailers on the market.

Table 4 : EU Weights & Dimensions (vehicle combinations)

Vehicle combinations	Weights
Road trains with five or six axles	
(a) two-axle motor vehicle with three-axle trailer	40 tonnes
(b) three-axle motor vehicle with two or three-axle trailer	40 tonnes
Road trains with four axles consisting of a two-axle motor vehicle and a two-axle Trailer	36 tonnes
Articulated vehicles with five or six axles	
(a) two-axle motor vehicle with three-axle semi-trailer	40 tonnes
(b) three-axle motor vehicle with two or three-axle semi-trailer	40 tonnes
(c) two-axle motor vehicle with three-axle semi-trailer carrying, in intermodal transport operations, one or more containers or swap bodies, up to a total maximum length of 45 feet	42 tonnes (modified)
(d) three-axle motor vehicle with two- or three-axle semi-trailer carrying, in intermodal transport operations, one or more containers or swap bodies, up to a total maximum length of 45 feet	44 tonnes (new)

The two documents include some intermodal-specific components:

- The maximum admissible mass for road and intermodal operations as specified in Annex 1 (see summary Table 4);
- The maximum length may be exceeded by 15 cm for vehicles or vehicle combinations engaged in the transport of 45-foot containers or 45-foot swap bodies, empty or loaded, when integrated in an intermodal operation; and
- The use of aerodynamic devices shall be compatible with intermodal transport operations and in particular when retracted/folder they shall not exceed the maximum authorized length by more than 20 cm. The detailed technical requirements for intermodal are set in the Regulation 2018/858.

4.1.1.6 Implementing Regulation on access to service facilities and rail-related services

Directive 2012/34/EU of the European Parliament and of the Council dated 21 November 2012 established a single European railway area providing a mandated track access regime for third-party railway operators. Infrastructure managers are required to grant non-discriminatory access to railway undertakings (and other possible applicants listed in the Directive) operating on the European railway network by following conditions:

- The principle of open access applies to the use of railway infrastructure for domestic and international rail services.

- Member states may exclude specific network and services from the mandated track access regime, such as local and regional stand-alone networks, networks intended for the operation of urban or suburban passenger rail services only, or infrastructure whose track gauge is different from the main rail network within the EU.
- The core provisions of the Directive set out the requirements and procedures for the allocation of railway infrastructure capacity and methods for the calculation and collection of infrastructure charges.

In addition, with the adoption of the implementing Regulation 2017/2177 on access to service facilities and rail-related services, the aim is to increase transparency in the market for all service facilities as defined in the Directive by imposing to the service facility operators to make publicly available information on their facilities such as access conditions, technical characteristics, general information etc. In this context, RNE and UIRR have jointly decided to operate a European Portal (see figure 5) to facilitate the exchange of information between the service facility operators and the railway users such as RUs, CT operators, and shippers. The portal is available at https://railfacilitiesportal.eu/.

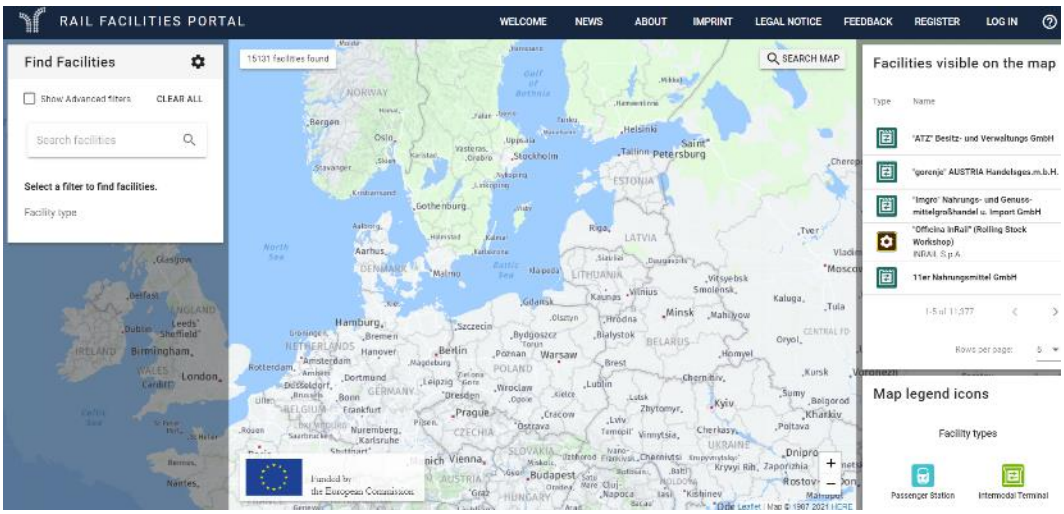

Figure 5: The Rail Facilities Portal (www.railfacilitiesportal.eu)

4.1.1.7 European Climate Law

The Commission's proposal for the first European Climate Law aims to write into law the goal set out in the European Green Deal – for Europe's economy and society to become climate-neutral by 2050. The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part.

With the European Climate Law the Commission proposes a legally binding target of net zero greenhouse gas emissions by 2050. The EU Institutions and the Member States are bound to take the necessary measures at EU and national level to meet the target, taking into account the importance of promoting fairness and solidarity among Member States.

The Climate Law includes measures to keep track of progress and adjust our actions accordingly, based on existing systems such as the governance process for Member States' national energy and climate plans, regular reports by the European Environment Agency, and the latest scientific evidence on climate change and its impacts.

Progress will be reviewed every five years, in line with the global stocktake exercise under the Paris Agreement.

The Climate Law also addresses the necessary steps to get to the 2050 target:

- Based on a comprehensive impact assessment, the Commission has proposed a new EU target for 2030 of reducing greenhouse gas emissions by at least 55% compared to levels in 1990. The Commission has proposed to include the new EU 2030 target in the Law.
- By July 2021, the Commission will review, and where necessary propose to revise, all relevant policy instruments to deliver the additional emissions reductions for 2030.
- The Commission proposes the adoption of a 2030-2050 EU-wide trajectory for greenhouse gas emission reductions, to measure progress and give predictability to public authorities, businesses and citizens.
- By September 2023, and every five years thereafter, the Commission will assess the consistency of EU and national measures with the climate-neutrality objective and the 2030-2050 trajectory.
- The Commission will be empowered to issue recommendations to Member States whose actions are inconsistent with the climate-neutrality objective, and Member States will be obliged to take due account of these recommendations or to explain their reasoning if they fail to do so.
- Member States will also be required to develop and implement adaptation strategies to strengthen resilience and reduce vulnerability to the effects of climate change.

4.1.1.8 e-FTI Regulation

The digital data exchange of freight information between the stakeholders and the authorities has been regulated with the adoption in 2018 of the electronic freight transport information Regulation (e-FTI). This piece of legislation sets out an EU harmonised framework for B2A digital exchange and is to be implemented in the context of the following EU legislation:

- Regulation No 11/1960 on non-discrimination of tariffs (Article 6.1)
- Combined Transport Directive No 92/106 (Article 3)
- Road Cabotage Regulation No 1072/2009 (Article 8.3)
- Waste Shipments Regulation No 1013/2006 (Articles 16(c) and 18.1)
- Dangerous Goods Directive No 2008/68/EC (chapter 5.4 of the Annexes to RID, ADR and ADN)
- Aviation Security Regulation No 300/2008 + Implementing Reg. 2015/1998 (Article 2.2 (b))
- Rail Interoperability Directive No 2016/797

The implementation of the e-FTI has been inserted in the list of tasks of the second mandate of the Digital Transport & Logistics Forum (DTLFII). All additional related EGTN impacts will be discussed in chapter 5.3.

4.1.2 International level

For the catalogue of legislation at international level the analysis has been mainly concentrating on the following organisations:

- The United Nations Economic Commission for Europe (UNECE), based in Geneva, is one of five regional commissions of the United Nations. Its major aim is to promote pan-European economic integration. It sets out norms, standards and conventions to facilitate international cooperation, particularly for transport. The UNECE agreements cover topics like transport infrastructures, road traffic and vehicles, inland waterway, border crossing facilitation, transport of dangerous goods and perishable foodstuffs.
- OTIF is an intergovernmental organisation based in Bern. COTIF, which gives rise to OTIF, defines the aim of OTIF as to promote, improve and facilitate international traffic by rail.

- The OSJD is an inter-ministerial organisation based in Warsaw. One of its main tasks is to manage the SMPS and SMGS conventions.
- The International Rail Transport Committee (CIT) is an association of over 200 railway undertakings and shipping companies that operate international passenger and/or freight transport services.

Table 5 provides a summary of all relevant legislation regarding freight transport with a focus on the transport mode 'rail'.

Table 5: Legislative initiatives at international level

		TOPICS				
Name	**Coverage**	**Infrastructure**	**Greening**	**Digitalisation**	**Operations**	**Intermodal**
United Nations Economic Commission for Europe (UNECE)						
European Agreement on Main International Railway Lines (AGC)	INT	x				
European Agreement on Important International Combined Transport Lines and Related Installations (AGTC)	INT	x				x
Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention)	INT				x	x
Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP)	INT				x	
European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)	INT	x		x	x	x
Organisation intergouvernementale pour les transports internationaux ferroviaires (OTIF)						
Transport of Dangerous Goods by Rail (RID)	INT	x		x	x	x
Contract of International Carriage of Goods by Rail (CIM)	INT				x	x
Organisation for co-operation between railways (OSJD)						
Agreement on International Railway Freight Communications (SMGS)	INT	x			x	x
International Rail Transport Committee (CIT)						
General Terms and Conditions of Eurasian carriage by rail (GTC EurAsia)	INT				x	x

4.1.2.1 UNECE

The **European Agreement on Main International Railway Lines (AGC)** defines a network of railway lines of major international importance, together with the parameters for infrastructure on these routes. The AGC is intended as the basis for coordinated governmental action in development of the European rail network.

Table 6: Infrastructure parameters (AGC)

INFRASTRUCTURE PARAMETERS FOR MAIN INTERNATIONAL RAILWAY LINES

	A Existing lines which meet the infrastructure requirements and lines to be improved or reconstructed	B New lines	
		B1 For passenger traffic only	B2 For passenger and goods traffic
1. Number of tracks	-	2	2
2. Vehicle loading gauge	UIC* B	UIC C1	UIC C1
3. Minimum distance between track centres	4.0 m	4.2 m	4.2 m
4. Nominal minimum speed	160 km/h	300 km/h	250 km/h
5. Authorized mass per axle:			
Locomotives (≤200 km/h)	22.5 t	-	22.5 t
Rail cars and rail motor sets (≤300 km/h)	17 t	17 t	17 t
Carriages	16 t	-	16 t
Wagons ≤ 100 km/h	20 t	-	22.5 t
120 km/h	20 t	-	20 t
140 km/h	18 t	-	18 t
6. Authorized mass per linear metre	8 t	-	8 t
7. Test train (bridge design)	UIC 71	-	UIC 71
8. Maximum gradient	-	35 mm/m	12.5 mm/m
9. Minimum platform length in principal stations	400 m	400 m	400 m
10. Minimum useful siding length	750 m	-	750 m
11. Level crossings	None	None	None

(Source: UNECE website)

The Agreement comprises the main body of the Agreement plus definition of a network of railway lines of major international importance (Annex 1) and definition of infrastructure parameters (Annex 2). Annex 2 (AGC parameters – see Table 6) lays down, inter alia, nominal minimum speeds for these AGC lines as follows:

- existing lines and lines to be improved or reconstructed: 160 km/h
- new lines: 300 km/h on lines for passenger traffic only; 250 km/h for passenger and goods traffic.

The "Yellow Book" is an inventory, published by UNECE, of existing AGC routes and the standards and parameters relating to them. UNECE's main Working Party on Rail Transport meets once a year in Geneva, amongst other things to complete the ongoing work of updating the Agreement.

The United Nations Economic Commission for Europe has for decades, even in the difficult times before the fall of the iron curtain, done substantial efforts to reach and extend a **"European Agreement on Important International Combined Transport Lines and Related Installations" (AGTC)**, defining common standards and parameters. The agreement entered into force in 1989 and currently has 30 countries signed up to it. With the extension of the EU and for the creation of a European railway market it is even more important to follow and accelerate this approach, i.e., the implementation and harmonization of technical infrastructure parameters Europe-wide–relevant to the AGTC structure (see Table 7).

Table 7: AGTC Main Infrastructure Parameters

INFRASTRUCTURE PARAMETERS FOR THE NETWORK OF IMPORTANT INTERNATIONAL COMBINED TRANSPORT LINES

	A		B
	Existing lines which meet the infrastructure requirements and lines to be improved or reconstructed		New lines
	at present	target values	
1. Number of tracks	(not specified)	(not specified)	2
2. Vehicle loading gauge		UIC B[2/]	UIC C[2/]
3. Minimum distance between track centres[1/]		4.0 m	4.2 m
4. Nominal minimum speed	100 km/h[3/]	120 km/h[3/]	120 km/h[3/]
5. Authorized mass per axle:			
Wagons ≤ 100 km/h	20 t	22,5 t	22,5 t
≤ 120 km/h	20 t	20 t	20 t
6. Maximum gradient[1/]	(not specified)	(not specified)	12.5 mm/m
7. Minimum useful siding length	600 m	750 m	750 m

1/ Not of immediate relevance for combined transport, but recommended for efficient international combined transport.
2/ UIC: International Union of Railways.
3/ Minimum standards for combined transport trains (see annex IV).

(Source: UNECE website)

The **Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention)** was drafted in 1975. It replaces the original Transport Internationaux Routier (TIR) Convention from 1959 and came into force on 20 March 1978. The convention has now 68 contracting parties. The status and information on contracting parties can be found on the UNECE website.

The objective of the TIR Convention is to facilitate international transit through a simplified Customs transit procedures and an international guarantee system. The underpinning of the so-called TIR system are a common customs document, the TIR carnet, a common guarantee system, the mutual recognition of customs controls and secured vehicle containers. Usage of the TIR system is limited to authorized operators.

IRU was mandated by the UN to administer TIR, which has over the last 70 years developed into the only globally applicable international customs transit and guarantee system. 77 Contracting Parties now use TIR, with approximately one million TIR carnets issued every year to over 10,000 transport and logistics companies and 80,000 trucks operating under the system across the world on a monthly basis.

Today, trucks operating under a TIR carnet use one single international guarantee from a journey's start to finish – even for intermodal transports. It is an easy, secure and reliable way to move goods across borders, be it straightforward bilateral transports between neighbouring countries or more complex multi-border journeys.

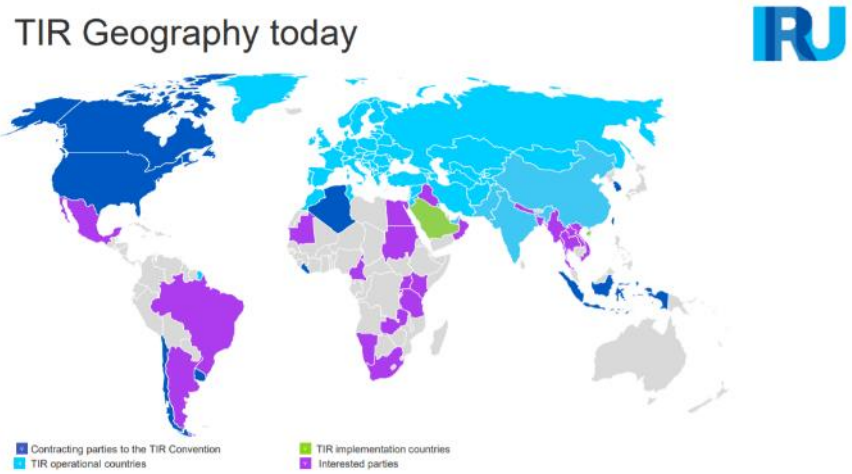

Figure 6: TIR Geography (Source: IRU website)

TIR Convention allows for the intermodal transport of goods provided that at least one leg of the journey is carried out by road. During a non-road leg, the TIR guarantee can be either suspended or continued. When suspended, TIR transport can be resumed at the customs office situated at the end of the non-road leg. TIR is most frequently used in intermodal operations in RoRo transport through ferry services, however the interest and volumes of transport of containers under TIR are growing now. The following cases have been already implemented: (1) Slovenia-Iran with a railway leg, (2) Emirates-Germany through the port of Hamburg. Other intermodal TIR scenarios are under investigation (with India, China, Arabic countries). Figure 6 presents one of the scenarios with China.

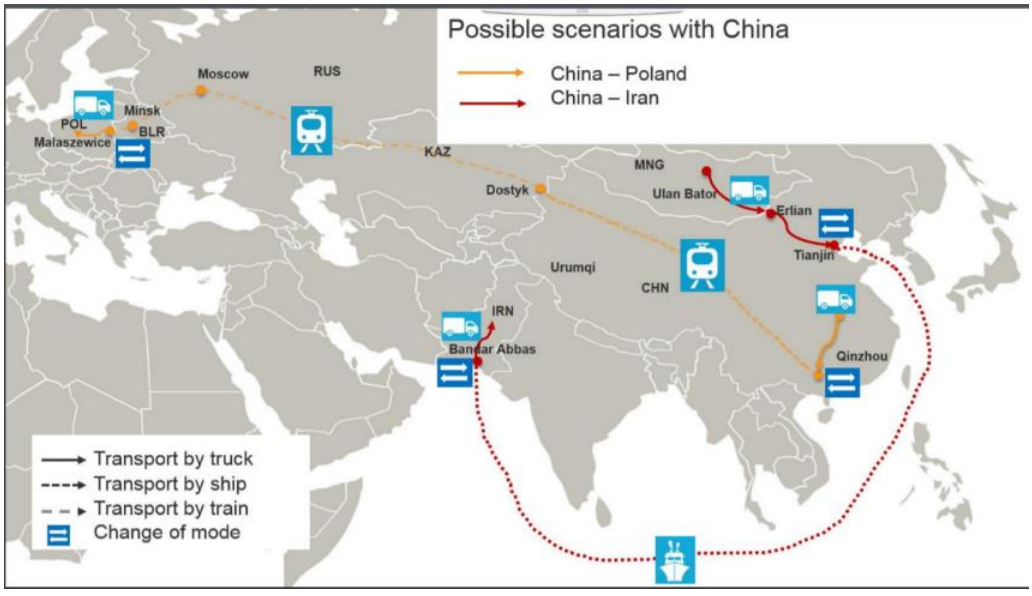

Figure 7: Possible intermodal TIR scenario with China (Source: IRU website)

The **Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP)** is intended to ensure that deep-frozen and chilled foodstuffs are transported efficiently, safely and hygienically and do not pose a danger to human health. It also helps countries avoid the wastage of food through spoilage caused by poor temperature control during carriage. The ATP Agreement provides common standards for temperature-controlled transport equipment such as road vehicles, railway wagons and sea containers (for sea journeys under 150 km) and the tests to ensure the insulating capacity of the equipment and the effectiveness of thermal appliances. New ATP equipment is required to undergo a test of its K coefficient, to prove that the heat escape from the inside to the outside of the body meets the values defined by ATP.

All 50 Contracting Parties to the Agreement – including non-UNECE countries (Morocco, Tunisia and Saudi Arabia) – are required to recognize ATP certificates for equipment that conforms to the standards issued by the competent authorities of other Contracting Parties. The ATP lists the products that can be carried under ATP and sets the warmest possible temperature of the load. Fruit and vegetables unless processed are as yet outside the scope of ATP. ATP applies if the point at which the goods are loaded and unloaded are in two different States and the point at which they are unloaded is situated in the territory of a Contracting Party. In other words it applies even if the State where the goods are loaded is not a Contracting Party. Some countries also use the ATP as the basis for their domestic legislation for temperature-controlled transport.

The **Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)** was done at Geneva on 30 September 1957 under the auspices of the United Nations Economic Commission for Europe, and it entered into force on 29 January 1968.

The Agreement itself is short and simple. The key article is the second, which say that apart from some excessively dangerous goods, other dangerous goods may be carried internationally in road vehicles subject to compliance with:

- the conditions laid down in Annex A for the goods in question, in particular as regards their packaging and labelling; and
- the conditions laid down in Annex B, in particular as regards the construction, equipment and operation of the vehicle carrying the goods in question.

Annexes A and B have been regularly amended and updated since the entry into force of ADR (last version dated 2021).

The structure is consistent with that of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations, the International Maritime Dangerous Goods Code (of the International Maritime Organization), the Technical Instructions for the Safe Transport of Dangerous Goods by Air (of the International Civil Aviation Organization) and the Regulations concerning the International Carriage of Dangerous Goods by Rail (of the Intergovernmental Organisation for International Carriage by Rail).

4.1.2.2 COTIF

The Convention concerning International Carriage by Rail (COTIF) applies in Europe, the Maghreb and the Middle East. OTIF Member States apply the majority of the appendices to COTIF:

- the Contract of International Carriage of Passengers by Rail (CIV) – appendix A,
- the Contract of International Carriage of Goods by Rail (CIM) – appendix B,
- the Contract of International Carriage of Dangerous Goods by Rail (RID) – appendix C
- the Contract of use of vehicles in international rail traffic (CUV) – appendix D
- the Contract of use of infrastructure in international rail traffic (CUI).

Figure 8 provides the geographical scope of COTIF and its appendices (situation May 2019).

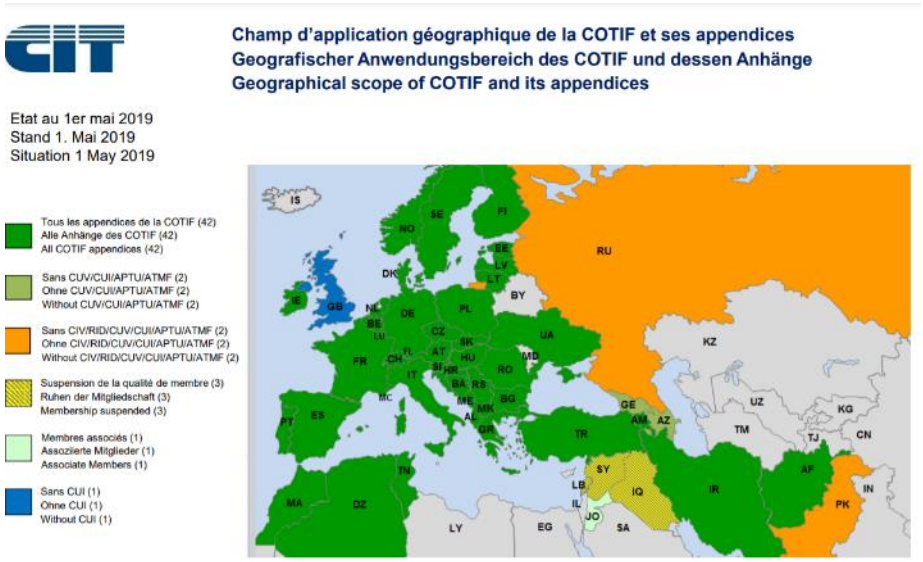

Figure 8: Geographical scope if COTIF and its appendices (source: CIT website)

The **Regulation concerning the International Carriage of Dangerous Goods by Rail (RID)** forms Appendix C to COTIF, and has an annex. This Regulation applies to a) to the international carriage of dangerous goods by rail on the territory of the RID Contracting States (see Figure 9 for map), b) to carriage complementary to carriage by rail to which the CIM Uniform Rules are applicable, subject to the international prescriptions governing carriage by another mode of transport, as well as the activities referred to by the Annex to this Regulation.

The RID lays down uniform rules for the safe international transport of dangerous goods. Such rules might also be extended to national transport in order to harmonize across the entire network the conditions under which dangerous goods are transported and to ensure proper functioning of the international transport market.

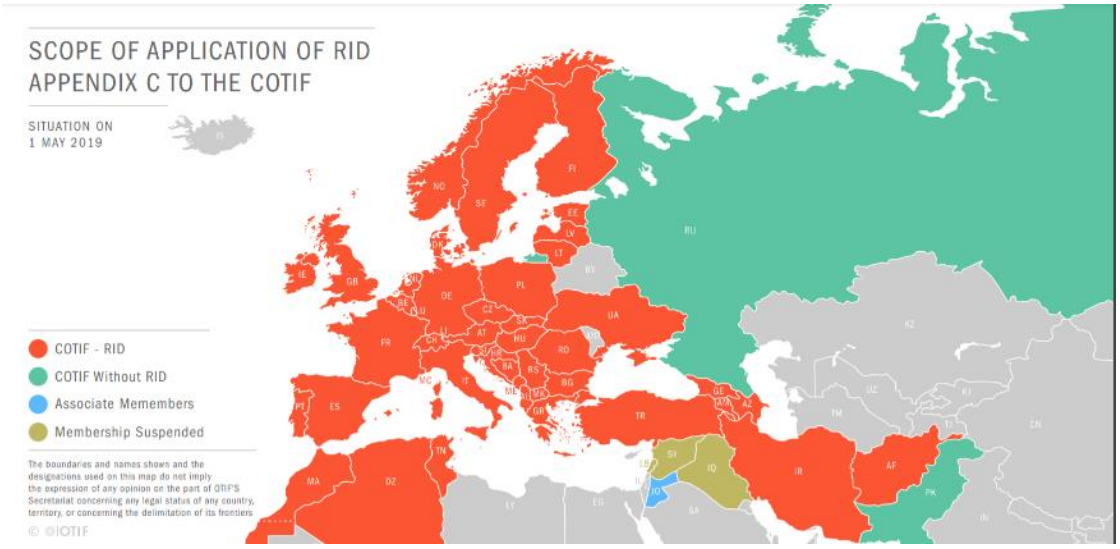

Figure 9: Scope of application of RID appendix C (source: OTIF website)

The **Contract of International Carriage of Goods by Rail (CIM)**, appendix B, defines the contractual relationship between the consignor and the carrier in railway transport in order to facilitate the cross border carriage of goods by rail under one single regime. It contains important provisions such as applicable to whole of the rail infrastructure unless reservations to scope are made at accession; applicable to carriage by road

or inland waterway in internal traffic of a member state as a supplement to cross border carriage by rail, consensual contract (no obligation to carry); and consignment Note (prima facie evidence of carriage).

Transport document prepared according to the CIM Convention is called CIM Rail Consignment Note. It is a document proving the conclusion of a transport contract with a railway undertaking. The contract is concluded when the railway undertaking accepts the shipment, and the dispatch station's stamp (a date stamp) is placed on the consignment note. The consignment note is signed/stamped by the sender and the carrier. The CIM is not a Bill of Lading.

The CIM consists of basically five printouts:

- original consignment note for the receiver of the shipment (consignee)
- invoice for carrier and supplementary sheet for carriers who invoice intermediate section
- arrival note/customs for destination customs office/destination carrier
- duplicate of the consignment note for the sender (consignor), as well as a supplementary sheet
- duplicate invoice for the forwarding carrier.

It is allowed to draw up a consignment note and its duplicate in electronic form.

A special CIM consignment note for Combined Transport and common CIM/SMGS consignment note haves also be designed.

4.1.2.3 OSJD

The SMPS and SMGS conventions govern the international carriage of passenger and freight, respectively, and are applied in Eastern Europe and Asia. Most OSJD Member States (some of which are also OTIF Member States) apply these two conventions. Figure 9 below shows which states apply the CIM, SGMS or both.

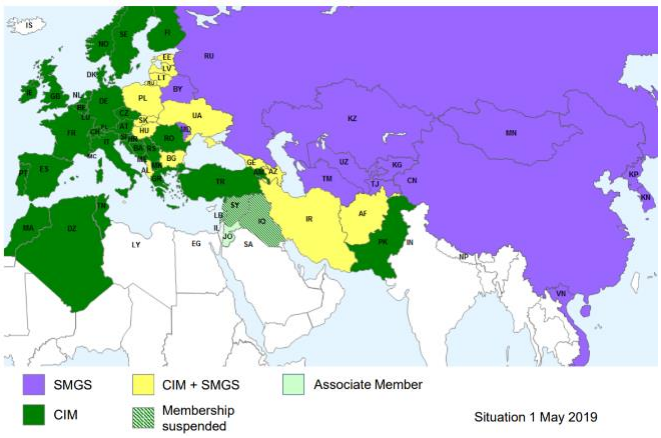

Figure 10: Overview of the geographical scope of the CIM and the SMGS (source: OTIF website)

The **Agreement on International Railway Freight Communications (SMGS)** entered into force on 1 November 1951, and undergoes revision from time to time. The SMGS Agreement structurally consists of the main agreement and 22 appendices. Besides, there is an accompanying document entitled SMGS Manual that contains comments and explanatory notes for the application of the agreement. The main agreement consists of 8 chapters and 41 articles.

- Chapter I "Basic provisions" defines the main subject of the Agreement to establish direct international freight rail traffic between the railways of the contracting parties. The chapter also covers the scope of application of the agreement and provisions related to duties of railways to carry goods, items not allowed for carriage or allowed for carriage on special conditions and special conditions for certain types of carriage.
- Chapter II "Conclusion of the contract of carriage" covers the issuing of the consignment note, acceptance of goods for carriage, calculation of goods' weight and quantity, declared value of goods,

responsibility for the validity of the data in the consignment note; tariffs and calculation of carriage charges and fines; and rules for the terms of goods delivery.

- Chapter III "Performance of the contract of carriage" covers the matters of payment of carriage charges, release of goods to the consignee, issuing of commercial acts and carrier's right of retention.
- Chapter IV "Amendment of the contract of carriage" includes provisions on the procedure of amending of the contract of rail carriage and special provision for the cases of when obstacles to release of goods to the consignee occur.
- Chapter V "Liability of Railways" establishes provisions on joint liability of railway carriers, overall principles related to limitation of carrier's liability, rules of limitation of liability in cases of shortage of goods, limitations of compensation by carriers in cases of full or partial loss, damage, and delayed delivery of goods. It also describes the rules of payment of compensation and accruing interest on the amount of compensation payable.
- Chapter VI "Claims and actions" covers the procedures of submitting claims and actions, sets the limitation periods and the rules of defining jurisdiction for legal proceedings.
- Chapter VII "Payments" contains the rules of payment settlement, including the cases of reimbursement of compensation paid by the railway carriers.
- Chapter VIII "General provisions" covers the issues of currency for the calculation of amounts of payments, status of the SMGS Manual, procedures for amendment of the Agreement and Manual, and on administering the implementation of the Agreement by OSJD bodies.

The appendices to the SMGS Agreement, which are referred to in the relevant articles of the main body of the Agreement, cover various specific aspects of international road carriage of goods (most relevant ones for PLANET are in bold):

- Appendix 1 "Items under the monopoly of postal authorities";
- **Appendix 2 "Rules of carriage of dangerous goods";**
- Appendix 3 "Rules of carriage of goods accompanied by the representatives of consignor or consignee";
- Appendix 4 "Rules of carriage of perishable goods";
- Appendix 5 "Loading dimensions";
- Appendix 6 "Stickers and marks on consignments, wagons, containers and
- consignment notes";
- Appendix 7 "Rules of carriage of road vehicles and tractors";
- Appendix 8 "Rules of carriage of containers";
- Appendix 9 (reserved);
- Appendix 10 "Rules of carriage of private and rented wagons";
- Appendix 11 "Rules of carriage of goods in transport packets";
- **Appendices 12 and 13 (contain a number of templates and operating instructions for SMGS consignment note, railway memorandum bills and other transport documents accompanying goods);**
- Appendix 14 "Rules of stowage and fastening of goods in wagons and containers";
- Appendices 15 – 18 (contain templates of documents related to international rail carriage);
- Appendix 19 (indicates official names and contacts of the railway undertakings for claim submission and handling);
- Appendix 20 (provides a template of claim for delayed delivery);
- Appendix 21 "Rules of carriage of combinations of road vehicles, road vehicles, trailers, semi-trailers and of demountable road vehicle bodies"; and
- A**ppendix 22 "Handbook on CIM/SMGS Common Consignment Note"**

4.1.2.4 CIT

The CIT published in 2019 its **General Terms and Conditions of Eurasian carriage by rail (GTC EurAsia)** which govern through contracts for the international carriage of goods between Europe and Asia by rail, including rail – sea traffic. They shall be applicable if the parties to the contract so agree.

The implementation of the General Terms and Conditions for Eurasian Transport will be made based on the International Private Law, including the difference of regulations and rules resulting from its implementation in different countries. With such a solution, cross-border railway freight transport can be carried out between countries applying the CIM provisions and countries applying the SMGS, based on a transport contract.

4.2 Legislative initiatives: EGTN relevance & preliminary assessment

Based on the previous chapters (inventory of EU and international legislations), the next step of the analysis is to evaluate if those initiatives will be or not impacting the EGTN development and how they will influence the EGTN (positively and/or negatively). The relevance and first preliminary assessment has been made under the following main scheme: valuate if the legislation has a link to at least to one of the three identified layers of the EGTN (physical, technological and governance) – in case of one selected box it is assumed as relevant for EGTN

1. Evaluate the impacts of the relevant legislations on the five EGTN attributes (a global score per attribute is fixed: from '+ +' = very positive to '- -' very negative)
2. If relevant, the results of some EU impact assessments will be added to the consortium's preliminary assessment.

The first version of this deliverable contains a series of tables (EU and international) which summarise the EGTN relevance and the first preliminary assessment per identified piece of legislation. The final version of the document will fine-tune the assessment by involving the LLs and external expert groups through online surveys and/or workshops.

4.2.1 European level

Legislation	EGTN Relevance			Impacts on EGTN attributes
	INFRA	TECH	GOV	
Maritime Single Window Environment Regulation		x	x	Geo-economics (+): as all EU ports are concerned (small, medium and large-sized facilities) Innovation (+) as new technologies have to be implemented to create the single window environment Impact (+): reduction of administrative tasks will influence positively the entire flow of goods on the corridors – no real impact on sustainability – potential - impacts on workers Integrated (++): the EU harmonised approach will promote the development of a global approach as planned for the EGTN – the commonly agreed governance layer will strongly contribute to the EGTN's aim. Inclusive (0): depending on the Member States involvement and financial resources: some

				regions will be better digitally equipped than others – risk of unfair competition between ports
Rail Freight Corridors (RFCs)	x	x	x	Geo-economics (++) all major economic EU regions (11 corridors) are covering the main EU freight flows Innovation (+): innovative corridor systems have to be implemented and new technologies should be promoted (such as Physical Internet) Impact (++): reduction of administrative tasks will facilitate the flow of goods on the RFCs– significant impact on sustainability (rail mode) – positive evolution of working staff and skills Integrated (+/0): currently the RFCs are working independently from each other – they are not yet integrated in a network of corridors to constitute a viable EU network of routes Inclusive (+): as the RFCs are covering also economical disadvantaged regions, it should have a positive impact on work forces (at nodes for example) and increasing skills
TEN-T Regulation	x	x	x	As EGTN is considered as an advanced and enhanced version of the TEN-T, the latter should have an impact on all EGTN attributes. In 2018, the Commission issued an impact assessment of TEN-T completion on growth, jobs and environment[2]. The following key results can be extracted: • An additional 800 000 European people will be employed in 2030 through the completion of the TEN-T core network, • 7.5 million person-years of jobs will be generated cumulatively during the period 2017 - 2030, • Additional GDP growth of 1.6 % will be realised in 2030, • 26 million tons of carbon dioxide emissions will be saved between 2017 and 2030 in the transport sector.
Combined Transport Directive	x			Geo-economics (+): this legislation should support the modal shift in any economical regions in Europe Innovation (+): the design and implementation of new Combined Transport services should be

[2] See synthesis report: https://ec.europa.eu/transport/sites/default/files/studies/ten-t-growth-and-jobs-synthesis.pdf

				supported by any innovative technologies (at nodes, first/last mile operations, railway journey) Impact (++): significant modal shift means greening of land transport especially when rail is used as the long-haul transport – socially and economically supported by citizens and policy-making bodies (European Commission) Integrated (0): no clearly identified proofs of any benefits Inclusive (0): same as above In 2016 the Commission issued an ex-post evaluation of the CT Directive[3] with clear identified impacts (reduced road congestion, reduced environmental pollution, increased road safety, reduced tax revenues, improvements of rail and waterborne transport systems, better management of transport resources).
Weighs and Dimensions	x			Geo-economics (0): this Directive does not consider any aspects of economics and regions – the economics lay in the optimization of loading capabilities per truck unit – however the possibility of alternative road combinations might open new routes and trade flows Innovation (+/0): the integration of the trucks/units as PI assets in the Physical Internet might be considered as a positive impact for the EGTN (improved visibility) Impact (0/+): the impacts of longer and heavier vehicles on greening road transport are still to be demonstrated. The International Transport Forum issued in 2019 a report on High Capacity Transport – Towards Efficient, Safe and Sustainable Road Freight. One of the conclusions High Capacity Vehicles provide an opportunity to improve transport efficiency by increasing the cargo capacity of the vehicle, carrying higher mass, volume or both. Fewer truck trips are required per freight task, which reduces truck travel, lowers carbon dioxide and NOx emissions, cuts fuel use and lowers shipping costs. However, it is recommended to use well-monitored trials and to configure this type of vehicles for the specific area in which they will operate.

[3] See https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2016)140&lang=en

				Integrated (+): a harmonised EU approach on road accompanied by an intermodal compatibility request supports modal shift and facilitates the operations between transport modes. Inclusive (0): no clear evidences that disadvantaged regions will gain any benefit from this legislation
Access to service facilities and rail-related services	x			Geo-economics (+): as mandatory requirement, all service facilities operators shall publish free of charge their service facility description (European Union) Innovation (+/0): no deployment of innovative solutions – rather the creation of common portals such as railfreightlocations.eu Impact (+): transparent publication of information of all nodes will facilitate the modal shift and therefore the use of alternative modes such as rail (modal shift promotion and improved sustainability) Integrated (+): the network of nodes is known and clearly accessible Inclusive (0): no clear evidences
EU Climate Law	x		(x)	In 2018 an in-depth analysis was carried out to set the main lines of a European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy: - Transport represents around a third of the final energy consumption in the EU. The currently dominant transport technologies rely on liquid fossil fuels. - Measures to consider: (1) low- and zero emission vehicles, vehicle efficiency and infrastructure, (2) The use of alternative and net-zero carbon fuels, (3) Improving the efficiency of the transport system, (4) Societal and Consumer choices - Electrification of rail (extended), electrification of road and/or alternative fuels The Commission published in September 2020 a staff working document as support document for steeping up Europe's 2030 climate ambition. In this report, some important assessments are expressed: - The transport sector is a particular challenge as it has difficulties to abate its emissions.

				- Options to decarbonise exist, but will require infrastructure development at local and EU scale (e.g. charging stations, hydrogen fuel stations). - Modal shift, increased use of inland waterway transport and rail and new forms of urban mobility are all part of the solution. - Multiple policies can reduce GHG emission. - Policies that directly impact emissions relate to CO2 emission standards for vehicles as well as policies that impact the carbon intensity of fuels - Other policies that indirectly impact also GHG emissions of transport are diverse and include wide span of possible actions. They include policies that impact modal shift, development of related infrastructure, traffic management systems, pricing systems addressing other externalities and promote digitalisation of the transport system.

Table 8: EU initiatives - Relevance and impacts on EGTN

4.2.2 International level

Legislation	EGTN Relevance			Impacts on EGTN attributes
	INFRA	TECH	GOV	
European Agreement on Main International Railway Lines (AGC)	x			Geo-economics (+): the annex I lists all lines at European level and national level (including non-EU countries). It includes the main important economical areas. All the enumerated freight nodes should be considered and should be compared to the TEN-T maps. Innovation (0): as the agreement covers mainly infrastructural components, this piece of legislation does not necessarily promote concepts such as PI, Industry 4.0... Impact (+): a more interoperable and harmonised railway network will improve railway operations in particular at border crossing points. The result will be a reduction of CO2 emissions. Integrated (++): harmonised approach for an integrated EU and non EU railway network (hard part will be optimized) Inclusive (0): no evidences of impacts on EGTN
European Agreement on Important International	x			Geo-economics (0): no real impact on EGTN

Combined Transport Lines and Related Installations" (AGTC)				Innovation (+): the necessity to adapt the railway gauge (tunnel) on the European network will push the Member States to use innovative solutions needed for infrastructural upgrades/designs. Impact (+): the defined parameters should promote modal shift onto rail by offering a larger range of services and by improving the railway operations in general. A more sustainable transport system is expected. Integrated (++): the railway infrastructure should be fully integrated Inclusive (0): no evidences of impacts on EGTN
Customs Convention on the International Transport of Goods under Cover of TIR Carnets (TIR Convention)	(x)			No direct relevance for EGTN. However, the operations at the borders are significantly improved (customs formalities).
Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP)				No relevance for EGTN. This Convention mainly ensures a safe transport of the perishable goods.
Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)				No direct relevance for EGTN. This Convention mainly ensures a safe transport of dangerous goods by road (mainly operational/technical rules).
Regulation concerning the International Carriage of Dangerous Goods by Rail (RID)				No direct relevance for EGTN. This Convention mainly ensures a safe transport of dangerous goods by road (mainly operational/technical rules).
Contract of International Carriage of Goods by Rail (CIM)	(x)			No direct relevance for EGTN. However for the railway operations the CIM consignment is the transport document to be used.
Agreement on International Railway Freight Communications (SMGS)	(x)			No direct relevance for EGTN but highly important for the railway operations on the Eurasian corridors with the CIM/SMGS consignment note.
General Terms and Conditions of Eurasian carriage by rail (GTC EurAsia)				No relevance for EGTN but interesting initiative to improve the contractual relations for railway transport between Europe and Asia.

Table 9: International initiatives - Relevance and impacts on EGTN

4.3 Selection of impacts to be fed into simulation

The EU legislative initiatives which were presented in the previous chapters of this document will affect after a first preliminary impact assessment the design and development of the EGTN vision. It is necessary to include into the simulation scenarios all impacts that will somehow influence the transportation network.

The purpose of this chapter is to perform a preliminary selection of the impacts of legislations which are expected to affect the flows in the EGTN and thus should be included in the simulation model and also the modelling parameters to which these impacts relate to.

The main parameters used by the macro simulation model include parameters such as the various costs (e.g., labour, capital, fuels), the speed (based on infrastructural characteristics), the load factor and the location of terminals (for rail and IWW transport). Furthermore, other parameters also used are related to the reliability, the security of modes, the value of time and the attractiveness per terminal.

Based on the previous chapters and on the expertise of several PLANET project partners, the impacts that should be considered for the simulation have been summarised in Tables 10 and 11 (per type of Regulation), respectively. The definitive results will be presented in the final version of this document.

Table 10: Impacts for simulation (EU legislative initiatives)

EUROPEAN LEGISLATIVE INITIATIVES

NAME	Main parameters	Description
MARITIME SINGLE WINDOW	• Labour • Administration	The implementation of the single window mainly influences the EGTN digital layer by improving the digital data exchange of maritime related-data. A fully digital maritime ecosystem will certainly influence the labour and the administrative costs for the maritime journeys.
RAIL FREIGHT CORRIDORS (RFCS):	• Infrastructure (harmonisation) • Traffic Management and slot management • Terminals • Administration	• reduction in costs of rail freight, reduced investments to sidings, reduction of waiting times at the borders • additional capacity for freight trains, reduction in times (scheduled timetables • reduction in assembling trains, reduction in transfer times, reduction of waiting times • reduction in bureaucracy
TEN-T REGULATION	• Infrastructure (harmonisation) • Load factor • Operations	• increase number of terminals • increase attractiveness through added-value services, • additional capacity for all transport modes (e.g. longer and heavier trains)
CT DIRECTIVE	• Modal Shift • Administration	• Reduction of related intermodal costs (trough financial and non-financial support)
WEIGHS & DIMENSIONS	• Greening • Operations • Load Factor	• Reduction of GHG emissions by the use of cleaner and aerodynamic road vehicles, • Increase load capacity (additional weight for intermodal operations)
ACCESS TO SERVICE FACILITIES	• Value of time (access to information)	• less time requested to collect information of one single service facility
EU CLIMATE LAW	• Greening	• Catalogue of measures to drastically reduce the GHG emissions in the transport sector (all land modes).

Table 11: Impacts for simulation (International legislative initiatives)

INTERNATIONAL LEGISLATIVE INITIATIVES

NAME	Main parameters	Description
AGC	• Infrastructure • Operations of trains	• Improve interoperability on the European and international network • Additional network capacity • Reduction in time (operations) • Increase of train quality and punctuality
AGTC	• Infrastructure • Operations of trains	• Improve interoperability on the European and international network • Additional network capacity • Reduction in time (operations) • Increase of train quality and punctuality
TIR CONVENTION	• Operations (borders)	• Reduction administrative costs at borders • Reduction of waiting times at borders • Reduction of operational costs
CIM	• Operations (transport document)	• Facilitation of data exchange • Increase of reliability (reduction of errors) • Increase the railway operations
SMGS	• Operations (transport document)	• Facilitation of data exchange • Increase of reliability (reduction of errors) • Increase the railway operations

5 Impact assessment of forthcoming policy initiatives on the EGTN development

5.1 Introduction

According to the section 3.1 of this document, the EGTN is a vision of the TEN-T of the future, as a Green, Physical Internet enabled network that takes advantage of technological innovations in its operations thus leading to a more economically, environmental and socially sustainable network compared to the existing TEN-T. EGTN are international logistics systems that make use of physical and digital infrastructures; aim at operational excellence for customers and external stakeholders; incorporate geo-economic context and are enabled by (disruptive) transport & logistics concepts and technologies.

The TEN-T policy, which is currently based on Regulation (EU) No 1316/2013, aims at addressing the implementation and development of a Europe-wide network of transportation infrastructure for all modes of transport, with the objective of closing gaps, removing bottlenecks and technical barriers and also to strengthening social, economic and territorial cohesion in the EU[4]. The current status of the Core TEN-T network is presented in Figure 10.

As Europe is facing challenges, especially with regard to sustainability, user-driven mobility and technological progress, new solutions are needed and the TEN-T policy must be revised to ensure a future-oriented, sustainable transport system. In order to do so the Commission started the TEN-T review process in April 2019 with an evaluation of the existing TEN-T Regulation together with an Open Public Consultation in view of its plans to put forward a revised TEN-T regulation in November 2021[5].

The reviewing process concluded that the work on the core network corridors and the relevant procedures in Member States between 2013 and 2020 shows that the planning and decision-making process on TEN-T has been largely suitable to achieve the policy's objectives. However, there is a need for specific reinforcements especially regarding the future challenges of the European transport system with respect to the ambitious climate change objectives, the digital transition and the significantly enhanced focus on user expectations as these requirements are embedded in the European Green Deal. The development of the EGTN vision is fully aligned with meeting these objectives and addressing the future challenges of the transport system.

The purpose of this chapter is to highlight specific policy initiatives of the EU which have not yet been translated to legislative actions or have become legislations only recently, and are expected to have an impact on the green and digitalisation aspects of the EGTN development. Starting from the presentation of the initiatives emerging from the recently published document of "Sustainable and Smart Mobility Strategy" and their relation to EGTN development, this chapter continues analysing in-depth the on-going policies deriving from the Digital Transport and Logistics Forum (DTLF) and also the EU taxonomy initiative for sustainable financing that may have an impact on the EGTN attributes.

More specifically, following the collection and presentation/analysis of the aforementioned strategy & policies, a qualitative assessment of the impacts of DTLF policies on the logistics processes will be performed and also their potential impact on the attributes of the EGTN will be presented. The methodological approach used for this process included a questionnaire survey to targeted experts, DTLF members and relevant logistics stakeholders who are opinion leaders and very experienced professionals in their domain. The response rate on the survey was over 80% and more than 20 complete responses were collected for analysis.

[4] https://ec.europa.eu/transport/themes/infrastructure/ten-t_en

[5] https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-ten-t-regulation-review

In the final section of this chapter, an initial selection of impacts on EGTN attributes will be made in order to integrate them in the simulation scenarios of the TEN-T modelling and the simulation analysis of T&L and ICT innovations. Moreover, the impact of the selected initiatives will be translated to reference specifications and policy recommendations for the realization of the EGTN.

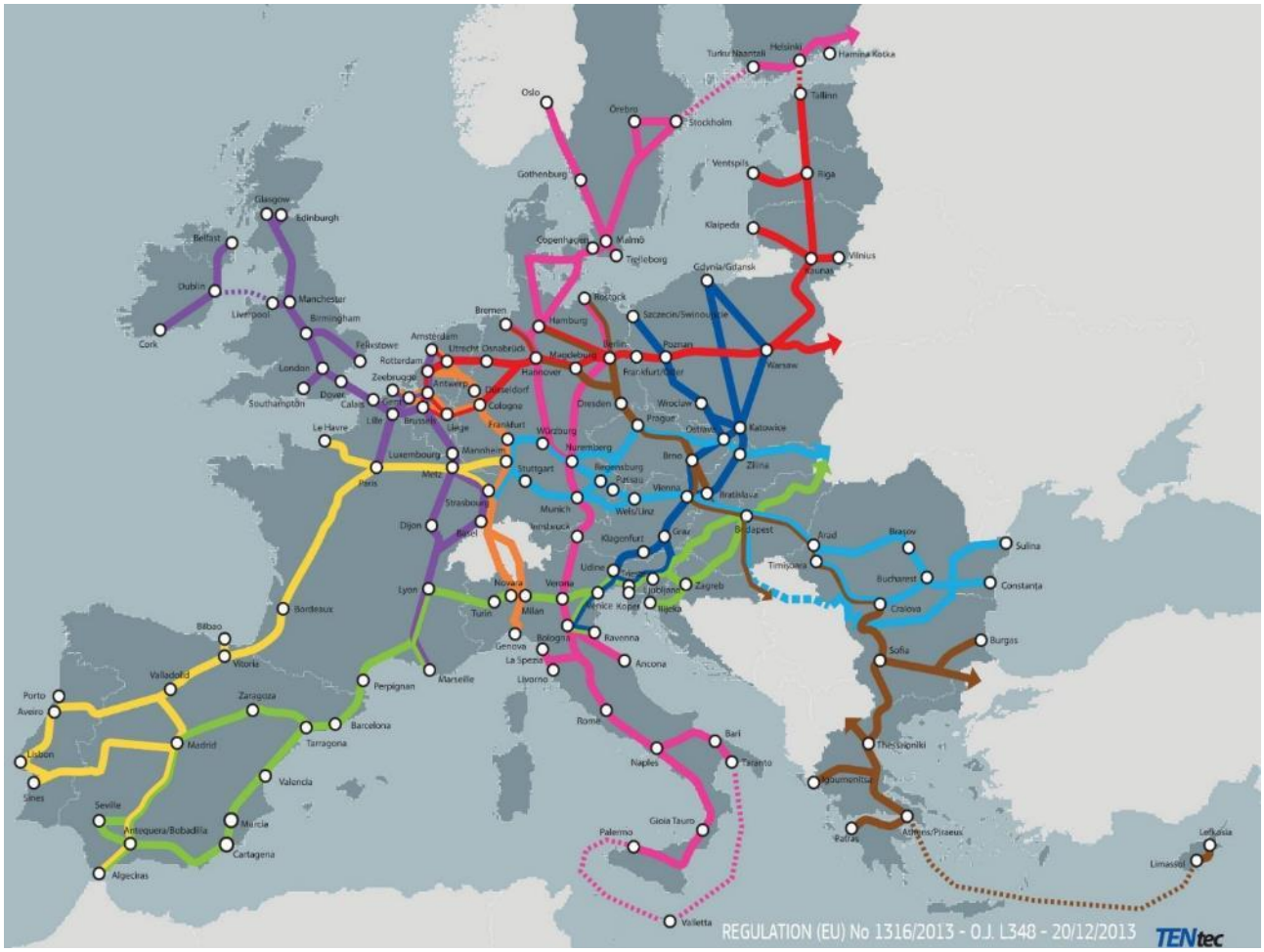

Figure 11: The current Core Network Corridors (CNC) based on Regulation (EU) No 1316/2013

5.2 The Sustainable and Smart Mobility Strategy

5.2.1 Summary of the strategy[6]

The transport sector accounts for approximately 5% of the EU's GDP and employs more than ten million people in Europe, and it is critical to European businesses and global supply chains. However, transportation has a high cost for society in terms of greenhouse gas and pollutant emissions, noise, road traffic accidents and congestion. More specifically, the transport sector represents around one quarter of the EU's total GHG emissions.

In December 2020, the European Commission published its 'Sustainable and Smart Mobility Strategy' together with an action plan comprising 82 initiatives drafted to guide the work that will be performed in the next four years. This strategy aims to lay the foundation for the EU transport system in order to achieve its green and digital transformation and make it more resilient to future crises, in alignment with the

[6] https://ec.europa.eu/transport/themes/mobilitystrategy_en

requirements of the Green Deal. According to these requirements, the objective is to reach a 90% cut in emissions by 2050, delivered by a smart, competitive, safe, accessible and affordable transport system.

In order to achieve this objective, there is a need for all transport modes to become more sustainable and the strategy has defined concrete milestones to ensure that the transition of the EU transport system towards a smart and sustainable future will remain on track. These milestones include:

By 2030:

- at least 30 million zero-emission cars in operation on European roads
- 100 European cities climate-neutral.
- high-speed rail traffic doubled across Europe
- scheduled collective travel for journeys under 500 km carbon neutral
- automated mobility deployed at large scale
- zero-emission marine vessels market-ready

By 2035:

- zero-emission large aircraft market-ready

By 2050:

- nearly all cars, vans, buses as well as new heavy-duty vehicles zero-emission.
- rail freight traffic doubled.
- a fully operational, multimodal Trans-European Transport Network (TEN-T) for sustainable and smart transport with high speed connectivity.

Overall, the vision of the "Smart and sustainable mobility" strategy is summarized by three main objectives, and the corresponding key areas for actions and initiatives are identified and presented in the published the strategy. These objectives are:

1. An irreversible shift to zero-emission mobility
2. Achieving seamless, safe and efficient connectivity
3. A more resilient single European transport area for inclusive connectivity

5.2.2 Relevance to EGTN development

The freight transport dimension of the initiatives aiming to achieving the three objectives of the "Smart and sustainable mobility" strategy is closely related to the development of the EGTN as a vision of an EU-Global, Green and technology enabled, resilient future TEN-T network. These objectives and the main initiatives which are related to freight transportation are presented below:

Objective 1: An irreversible shift to zero-emission mobility

The achievement of the transition of the transportation system towards zero-emission mobility is based on three main pillars:

- Pillar 1: Making all transport modes more sustainable,
- Pillar 2: Making sustainable alternatives widely available in a multimodal transport system and
- Pillar 3: Putting in place the right incentives to drive the transition.

With respect to freight transportation, these pillars imply that there is a need for measures in order to change the mix of energy used by lowering the dependency on fossil fuels and boosting the use of renewable or low-carbon fuels. In addition, actions to achieve a significant modal shift will be required in order for freight to be transported through modes such as rail, inland waterways and short sea shipping which have a significantly lower carbon footprint compared to road transport. Finally, the internalization of the external cost of freight transport based on the principles "the polluter pays" and "the user pays" need to be implemented to motivate the transition to more sustainable transport.

In this context and in relation to the process of **making road transport more sustainable**, the suggested initiatives and policies aim at motivating the transition to zero/low-emission vehicles by enacting more stringent standards regarding CO_2 emissions for heavy duty-vehicles and also regarding air pollutant emissions for internal combustion engines (Euro 7). In addition, the adjustment of the roadworthiness legislative network is proposed to ensure the lifetime compliance of vehicles with emission and safety standards. On the other hand, it suggests a comprehensive policy in order to stimulate demand for zero-emission vehicles and measures to support the acceleration by suppliers and operators of large-scale deployment of sustainable and low-carbon fuels together with the creation of a comprehensive network of charging and low-carbon fuel refueling infrastructure. Finally, the strategy also foresees the support of the development of zero-emission solutions such as battery-electric or hydrogen fuel-cell vehicles, particularly for use in commercial fleets, buses and heavy-duty transport.

Regarding rail transport, the further electrification of the network is proposed with the development of hydrogen-based solutions as an alternative where electrification is not viable. In the case of waterborne transport, the priority of access to renewable and low-carbon liquid and gaseous fuels is suggested because of the current lack of suitable alternative energy sources. Overall, a "basket of measures" for decarbonizing maritime transport is proposed, which will be defined in close cooperation with all international organizations such as the International Maritime Organisation (IMO).

Besides making means of transport more sustainable, the strategy also foresees the greening of ports through incentivising the deployment of renewable and low-carbon fuels and the implementation of an onshore power supply ("cold ironing") system to provide moored vessels with renewable power instead of fossil fuel energy. Furthermore, it suggests the incentivising of the development and use of new, cleaner and quieter vessels, the greening of port services and operations and the optimisation of port calls through wider use of smart traffic management.

In terms of **making sustainable alternatives widely available in a multimodal transport system** and more specifically in the context of greening freight transport, the strategy foresees initiatives which include the updating of the existing frameworks for intermodal transport and revising the regulatory framework for the Combined Transport Directive together with introducing economic incentives for both operations and infrastructure. Furthermore, it considers that multimodal logistics must be part of the process for greening freight transport, both within and beyond urban areas, and for this reason sustainable urban mobility planning should also include the freight dimension through dedicated sustainable urban logistics plans.

Furthermore, the strategy highlights the scarcity of transhipment infrastructure and also of inland multimodal terminals, especially in certain parts of Europe. It proposes that resolving this issue together with closing the missing links in multimodal infrastructure be made the highest priority. It also proposes to move towards a more efficient transport system through improved transhipment technologies, multimodal exchange of data and smart traffic management systems in all modes in order for, all transport modes for freight to ultimately come together via multimodal terminals.

Rail has a key role in promoting multimodality, and for this reason the strategy considers that rail freight needs significant support through increased capacity, strengthened cross-border coordination and cooperation between rail infrastructure managers, better overall management of rail networks and the deployment of new technologies. In this context, the revision of Regulations governing Rail Freight Corridors and the TEN-T core network corridors is proposed in combination with a proposal for improving rules on rail capacity allocation, which together with the ongoing project on the timetable redesign will provide flexible rail routes.

As for inland waterways transport, it is proposed to define actions in order to preserve its modal share and also to further exploit its untapped potential as a sustainable mode of transport, both along TEN-T corridors and in cities where inland waterways can green the last mile of city logistics.

Finally, with regard to **putting in place the right incentives to drive the transition** towards zero-emission mobility, the 'polluter pays' and 'user pays' principles are proposed to be implemented without delay in all transport modes through a comprehensive set of measures to deliver fair and efficient pricing across all transport modes. Emission trading, infrastructure charges, energy and vehicle taxes must come together under a mutually compatible, complementary and coherent policy. At the same time, the strategy proposes to establish a European framework for the harmonised measurement of transport and logistics greenhouse gas emissions, based on global standards in order to provide adequate information on the environmental footprint and empower businesses to give sufficient consideration to and make more sustainable transport choices.

Objective 2: Achieving seamless, safe and efficient connectivity

The strategy aims to achieve seamless, safe and efficient connectivity that extends to freight transport by setting up the right framework and enablers to facilitate the transition via innovation and digitalisation to a multimodal transport system that is much more efficient and sustainable.

In this context, the strategy proposes that the EU take full advantage of smart digital solutions and intelligent transport systems (ITS) and focus its actions on supporting the integration of transport modes into a functioning multimodal system. This will be achieved by exploiting the opportunities presented by connected, cooperative and automated mobility (CCAM) with a vision towards making Europe a world leader in the development and deployment of CCAM services and systems, and thus contribute to European leadership in safe and sustainable road transport.

In addition, the strategy foresees future mobility with paperless operations, enabled through the availability of electronic certificates and freight transport information together with real-time tracking and tracing of goods, which is considered a significant step towards the completion of the Digital Single Market, the real-time economy and green transition.

With regard to achieving efficient capacity allocation and traffic management, which is considered crucial to a truly smart transport system, the strategy proposes investments in the deployment of the European Rail Traffic Management System (ERTMS) together with the further development of Vessel Traffic Monitoring and Information Systems (VTMIS), which will facilitate safe deployment of automated and autonomous maritime operations.

Especially for rail transport, in order for rail automation and traffic management to become a reality on cross-border main lines, further efforts are proposed through the update of technical specifications for interoperability (TSIs) to include also new technologies such as 5G and satellite data, and to provide a readily upgradeable and common system architecture.

Regarding new technologies and services such as 5G, which ensures the highest level of performance of digital infrastructure, the strategy foresees that the EU will strongly support their development by creating favourable conditions and providing the necessary tools for their validation, and that the Commission will drive research and deployment of innovative and sustainable technologies in transport.

Furthermore, in order to facilitate the digital transformation of the transport sector, it is proposed to ensure that the key digital enablers are in place, which include the electronic components for mobility, network infrastructure, cloud-to-edge resources, data technologies and governance, and Artificial Intelligence. Especially regarding the latter, AI is considered essential for transport automation in all modes which have digital technologies and components at their core, and for this reason the Commission envisions an AI ecosystem of both excellence and trust.

Finally, the strategy considers that the digital transformation of the transport and mobility sector requires further efforts related to data availability, access and exchange, and for that reason the creation of a European Common Mobility Data Space is proposed. This Mobility Data Space should function in synergy with other key systems, including energy, satellite navigation and telecommunications, while being cyber-safe and compatible with Union data protection standards.

Objective 3: Achieving a more resilient single European transport area: for inclusive connectivity

Through its third objective, the strategy for Smart and Sustainable mobility aims to increase the resilience of the EU transport network and enhance the single European transport area, based on the lessons learned during the COVID-19 pandemic. The pandemic had significant consequences on the transport sector as a result of the containment and mitigation measures and the corresponding reduction in demand for transport services, which led to significant disruptions in supply chains and also to many businesses in the transport sector, especially SMEs, facing operational and financial difficulties.

In order to address this situation and prepare for similar situations in the future, this strategy considers as a key parameter the reinforcement of the single market through investments coordinated and prioritised within EU funding programmes. According to the strategy, these investments will need to be prioritised for projects with the highest social, environmental, economic and EU added value and direct impact on jobs, growth and resilience. This will be achieved through financial instruments that will support investments in policy priority areas. At the same time, the strategy proposes that the transport lending policy of the EIB should also offer a comprehensive framework in order to attract private investment to improve resilience and accelerate the deployment of sustainable and smart technologies in relation to all transport modes.

Regarding the latter, it is proposed that the transition of investments towards more sustainable and digital mobility be supported by the completion, for all transport modes, of the technical screening criteria based on the Taxonomy Regulation, the upcoming European Green Bonds Standard anchored on EU Taxonomy, and also the revision of transport-relevant State aid rules.

The investments in transport infrastructure are considered crucial for ensuring connectivity across the EU, the sustainability of the economy and also cohesion among Member States, and for this reason the strategy proposes to ensure that the TEN-T will be completed according to the time plan. In this context, it is also proposed that the EU must promote transport investments such as TEN-T projects, based on strategic planning while ensuring that the infrastructure will be adapted to climate change and resilient to disasters by providing guidance on climate-proofing via the TEN-T review process and the climate adaptation strategy.

In terms of enhancing/completing the European single transport area, the strategy proposes the implementation or the proper enforcement of the existing rules and to review or propose legislation in order to remove all obstacles to the free movement of goods and services.

Finally, it is proposed that contingency plans be prepared in order to avoid future disruptions through the cooperation of the EU, the Member States and sector representatives. The objective of these plans will be to ensure business continuity and to coordinate response measures in the transport sector on the basis of guidelines and legislation developed during the COVID-19 pandemic. This may include new health and safety and operational measures together with the establishment of a harmonised minimum level of essential transport services and also the possibility to adapt transport legislation to allow for a swift response to crises.

Besides the measures and initiatives described so far, the strategy also deals with the most valuable asset of the transport sector, human capital, which is the key to a sustainable and smart transition. It proposes measures for all modes of transport, in order to strengthen the legislative framework on conditions for transport workers and to provide higher social standards that will reverse the current general lack of attractiveness of the sector due to harsh working conditions observed in certain parts of the transport sector.

Furthermore, the strategy is to address the challenges emerging from the transition towards automation and digitalisation in relation to the risk for loss of low- and medium-skilled jobs, on the one hand, and on the other it is intended to create new opportunities for quality jobs in an improved working environment that could become more attractive for women and young people.

5.2.3 Assessment of Sustainable and Smart mobility strategy impacts on EGTN development

Initiatives towards an irreversible shift to zero-emission mobility

All the initiatives and proposed measures described above are aimed at achieving low or zero-emission freight transportation, which is an objective fully aligned with the green aspect of the EGTN. Therefore, it becomes obvious that the realisation of the sustainable and smart mobility strategy towards zero-emission mobility is expected to have a positive impact on EGTN development by facilitating the **achievement of the environmental sustainability component of the EGTN attributes**.

This will be ensured by changing the modal share of freight transport to more environmentally friendly modes, while at the same time road transportation will be moved towards sustainability by implementing new technologies and facilitating the use of alternative energy sources. The latter is particularly important since, as noted in the strategy, "all transport modes are indispensable for our transport system", and the development of **Synchromodality**, of which road transportation is an integral part, is an important component of the EGTN vision.

At the same time, the development of intermodal transport and the multimodality in freight transport which this strategy foresees will have a positive impact on the economic efficiency of operations and, thus, will help realise the **economic sustainability component of the EGTN attributes**. Furthermore, the development of multimodality in freight transport will also facilitate the increase of the **resilience of the network,** which is another significant component of the EGTN attributes.

Finally, with regard to rail transportation, the proposed integration of the Rail Freight Corridors and the TEN-T core network corridors into 'European transport corridors' through the revision of the governing Regulations will result in advances such as train length, loading gauge, improved operational rules and the completion of key missing links which will help achieve the **interoperability of rail infrastructure and processes across borders along EGTN global corridors** component of the EGTN attributes.

Initiatives towards achieving seamless, safe and efficient connectivity

The initiatives and proposed measures of the Sustainable and smart mobility strategy for achieving seamless, safe and efficient connectivity are closely related to the innovation attribute of the EGTN. In this context, it is expected that their implementation will have a significant positive impact on EGTN development by facilitating **the introduction and exploitation of innovative technologies (Blockchain, IoT, AI, 3D printing etc.) in logistics operations on the EGTN** and also the **implementation of the PI concept (PI containers, PI nodes, PI moves etc.) in EGTN corridors,** which are the two components of the innovation attribute of EGTN.

At the same time, the contribution of the digital transformation of transport to the integration of all transport modes into a functioning multimodal system will have a positive impact on the economic efficiency of operations and thus will help realize the **economic sustainability** and the **resilience of the network** components of the EGTN attributes.

Finally, with regard to rail transportation, the proposed deployment of the European Rail Traffic Management System (ERTMS) and the measures for rail automation and traffic management on cross border main lines and the update of technical specifications for interoperability (TSIs), will help realize the **interoperability of rail infrastructure and processes across borders along EGTN global corridors** component of the EGTN attributes.

Initiatives towards achieving a more resilient single European transport area and for inclusive connectivity

The proposed initiatives and measures of the sustainable and smart mobility strategy, which are related to achieving the objective of a more resilient single European transport area, are also expected to have an impact on several components of the EGTN attributes.

More specifically, the proposed enhancement of investments, both public and private, in infrastructure and also in digitalization will help achieve the goal of a multimodal transport system and thus **increase the resilience of the EGTN through multimodality**.

Furthermore, the support of digitalization through investments, especially from private businesses, will also facilitate the **introduction and exploitation of innovative technologies (Blockchain, IoT, AI, 3D printing, etc.) in logistics operations on the EGTN** and will support the **implementation of the PI concept on the EGTN corridors**.

Finally, with regard to the social aspect and the inclusiveness attribute of the EGTN development, the foreseen initiatives aim to strengthen legislation on working conditions and also to provide a balance between the creation of new job opportunities and the risk for low- and medium-skilled job losses due to digitalization and automation. In this context, a positive impact is expected on **social sustainability across the EU and on the promotion of social equity regarding employment opportunities in the Transport and Logistics sector across the EU and across the EGTN, including disadvantaged regions**.

5.2.4 Summary of the Digital Transport & Logistics Forum (DTLF) initiative

Every day, an innumerable number of containers and pallets are transported by road, rail, sea, air and inland waterways all across Europe. To make these movements possible, the different involved actors need to exchange information at every stage of the logistics chain. Commercial concerns, information fragmentation and the continuous use of paper documents are the major challenges that hamper efficient and real-time information exchange, resulting in longer waiting times, unpredictable arrivals, penalties that cost extra money and higher administrative and operational costs and emissions. Digital Transformation offers an opportunity to address these limitations and improve the quality, efficiency and sustainability of freight transport services. Since 2015, a group of different stakeholders coordinated by the European Commission (EC) have been working together in the DTLF in order to reach this objective. The DTLF supports the EC in implementing 100% digital information exchanges and a shared transport and logistics dataspace.

The work of the DTLF so far has been divided into two mandates. The first DTLF mandate (2015-2018) was split between two subgroups, focusing on the digitalization, acceptance and harmonization of electronic freight transport documents and the establishment of a digital corridor information systems. The first mandate concluded with the Electronic Freight Transport Information (e-FTI) Regulation proposal (Subgroup 1) to promote the use of digital technologies for fulfilling regulatory requirements related to the transport of goods within the EU which was adopted on 17 May 2018 as part of the Third Mobility Package. In addition, Subgroup 2 concluded its work with an endorsement of a generic concept for “digital corridor information systems” in order to facilitate data sharing among different supply chain stakeholders. The need for continuation and further elaboration on the achievements of the DTLF’s first mandate, forced the EC to set up the second mandate of the forum in September 2018. The objective was to continue towards further digitalization of the exchange and acceptance of information for regulatory compliance purposes in transport and logistics and assist the EC in the implementation of the e-FTI Regulation. Moreover, the goal of Subgroup 2 is to foster EU cross-border freight information systems development by testing and validating a federative network of platforms. The following sections analyze in detail the two DTLF subgroups and their different teams, which are organized to better fulfill the policy recommendations.

The outcomes of the DTLF will have significant relevance to the vision of the Integrated EU-Global T&L Network (EGTN). The outcomes of the work of both DTLF subgroups have specific relevance to the EGTN’s vision. More specifically, e-FTI platforms (Subgroup 1) will lead to change from road transport to multiple modes of transport, thus optimizing the use of current and emerging transport modes in the EU which can later be transformed globally as part of the development of the EGTN. In addition, the development of a federated network of platforms (Subgroup 2) will leverage new and advanced technological solutions to enable seamless data exchange between different supply chain stakeholders at every stage of the supply chain within the EU, thus creating a solid platform network that could easily be enlarged with additional platforms outside the EU.

5.3 Paperless transport (e-FTI) policy impact

5.3.1 Summary of the policy

As mentioned in the previous paragraph, DTLF Subgroup 1 (Paperless Transport), contributes to the development of the implementation rules of the new EU Regulation on electronic exchange of freight transport information (e-FTI). The e-FTI concerns transport information required by EU and national legislation on different types of cargo carried through Europe via road, rail, air and inland waterways. It will allow economic operators to record cargo-related information only once at the beginning of the journey and share it electronically with the relevant authorities or with their business partners at any time. The logistics sector will have great benefits from the massive reduction of administrative costs, while at the same time more efficient logistics chains will allow additional operational savings, through seamless data exchange. Although the e-FTI is currently an EU Regulation, it was decided that additional work is needed in order to assist with the proper and timely implementation of the e-FTI from the relevant stakeholders within Europe. The overall process from DTLF action on paperless transport to the full e-FTI implementation is shown in Figure 12 below.

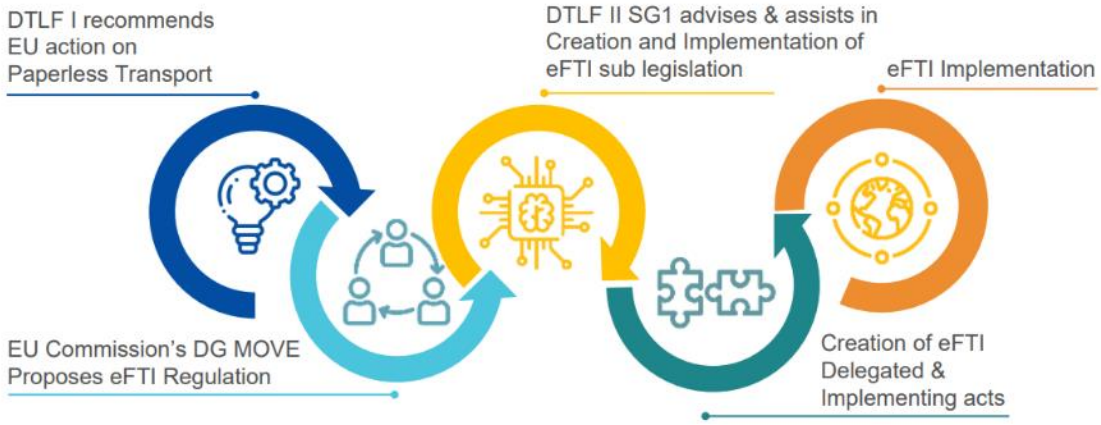

Figure 12: DTLF Subgroup 1 Mandate (Source: DTLF website)

The current follow-up work on Paperless Transport of the second mandate of the DTLF can be summarized in the following four general recommendations that came from the first mandate (DTLF final report, 2018):

1. Additional work towards further digitalization of the exchange, reuse and acceptance of information for regulatory compliance purposes in the transport and logistics sector;
2. To facilitate the additional work, the EC renewed the mandate for the DTLF, which will provide an opportunity for different stakeholders (public administrations, business, science) to discuss and explore various opportunities to make optimal use of digitalization in the logistics sector;
3. The second DTLF mandate should have sufficient knowledge, skills and expertise to complete the requested tasks, based on the contribution of the active members as well as on external experts in specific topics.
4. The DTLF work program should focus on the areas covered under recommendations 1 and 2 and more specifically on assisting the EC in the preparatory work for the implementation of the e-FTI Regulation.

As stated above, the e-FTI Regulation has been approved by the EU and will be fully in place by 2025. It establishes a legal framework for road, rail maritime and air transport operators to share information with enforcement authorities in an electronic format. More specifically, e-FTI will include:

- Single data definitions for the electronic representation of the freight transport information;
- Interoperable systems or platforms where businesses may record and share transport information;

- Common rules and procedures for all competent authorities within the EU to access and process information on private e-FTI platforms.

The main problem in freight transport across Europe, is the number of documents used by all involved parties. It was detected that a large variety of different documents for each transport mode are used, such as: purpose, type of good transported, means of transport and combination, national vs international etc.), thus resulting in various problems and delays in transit time. More than 99% of freight transport operations within the EU still use paper documents, while more than 380 million business hours are spent yearly in processing paper-based transport information (whole EU, 2018 estimate). The impact assessment of the e-FTI Regulation proposal will be massive in terms of both money and time.

More specifically, the objectives of the e-FTI Regulation proposal can be summarized as follows:

1) **Acceptance** by public authorities of freight transport information made available electronically
2) **Uniform implementation** of the obligation of acceptance by the authorities and
3) **Interoperability** of the IT systems and solutions used.

The e-FTI policy proposes a harmonized EU general framework for Business-to-Authority (B2A) electronic exchange of freight transport information. The e-FTI policy initiative consists of five central tenets:

1) No new information requirements;
2) Obligation of authorities to accept the information electronically (only) if presented via certified platforms or certified service providers;
3) obligation for economic operators to present information electronically via certified platforms or certified service providers (only) when opting to use an electronic form, the information needs;
4) single sets of common general requirements for platforms' functionalities and, respectively, for providers' obligations to ensure authenticity, integrity, accessibility, security and interoperability of data;
5) EU harmonized certification scheme for platform and services providers.

The e-FTI information flow from start to finish (Figure 13) is highlighted below and includes all the tenets described above. Despite the fact that e-FTI refers to B2A information exchange, it can be seen that a B2B (business-to-business) information exchange ecosystem is highly required thus generating the need to expand the work in the future in order to also cover B2B information exchanges. The process starts from the Economic Operator who creates the necessary information for the transport through the B2B e-information exchange ecosystem. Once it gets the information, the process starts with the provision of the information in digital form to the driver. When the authority needs to check the information, the driver can retrieve it from the authority access platform in which the B2B e-information exchange ecosystem has provided to. The authority, validates the information received and the driver can continue on to the final destination.

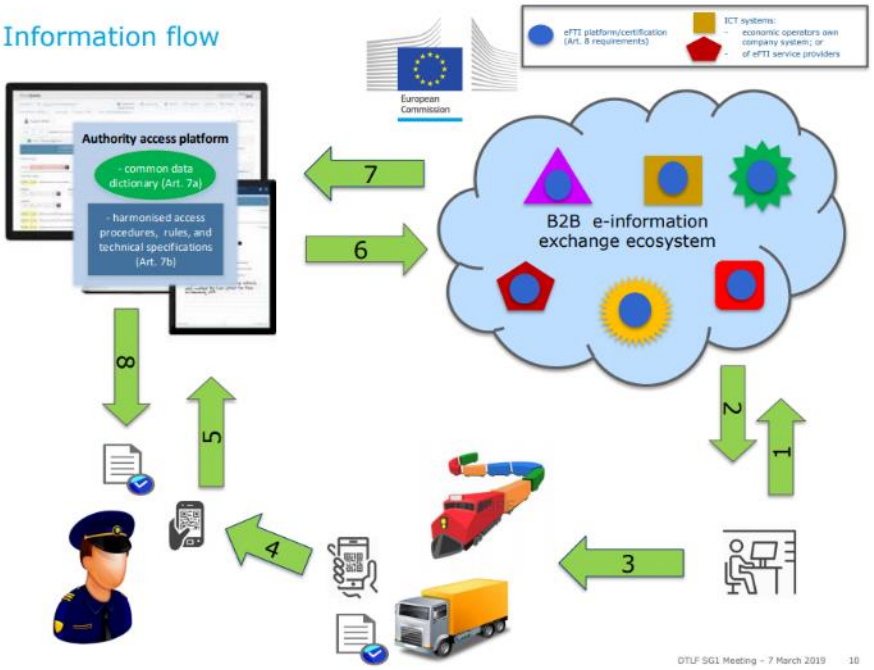

Figure 13: e-FTI Information flow (source: DTLF website)

The system architecture as designed covers bidirectional links between economic operators and e-FTI certified platforms which can then communicate with the National Authorities and validate the quality of information needed for each transport. The successful implementation of the e-FTI Regulation across EU Member States will initiate discussion about global adoption in order to finally reach, in the future, a homogenous method of electronic exchange of freight transport information for all modes of transport in use worldwide. The PLANET project will capitalize on the results of this effort in order to improve the realization of the development of the EGTN, taking into account all the necessary expected attributes that could impact the development of EGTN.

For better coordination and in order to ensure adherence to deadlines and the quality and consistency of the work, four different teams were established to perform the tasks defined at the beginning of the second mandate. The four teams work in parallel in order to avoid overlaps and ensure the successful completion of the related tasks. The four teams are: 1) Data modelling, 2) Functional, 3) Technical and 4) Certification & Implementation. The work of Team 4 has not started yet. In the following sections, a brief description of the teams and their relevance to PLANET is highlighted.

Team 1: Data Modelling – Transport Data Model (TDM)

The objective of this team is to conduct preparations for the establishment of the e-FTI common dataset and subsets in relation to the regulatory requirements under the scope of this regulation. The scope is to gather all the legally required information within the scope of the e-FTI Regulation in close collaboration and using of closely related EU and international data standards and requirements. This work has great relevance to PLANET as it will take into account all EU and national legislations and practical requirements together with international standards and conventions and private sector (B2B) standards, in order to do the preparatory work for the establishment of the Transport Data Model (TDM). The significance of the above is that the model should be globally accepted and applied data sets created by organisations such as the UN/CEFACT and the World Customs Organisation (WCO) for multimodal use, including those developed in relation to modal international transport conventions which is in general the vision of the EGTN development. World class players in trade such as China, India and others, will have the opportunity to fully adopt, at least, some aspects of the UN/CEFACT Multi Modal Transport Reference Data Model (MMT) in order to further improve the development of the EGTN. The MMT is a data model that allows for the development and systematic

maintenance of data models by providing libraries of data, data groups, structuring of data and code lists and supporting their reuse and customization. The MMT contains more than 30 years of knowledge contributed by more than 100 experts experienced in the international global supply chain, including transport and logistics and can be of great importance in the successful implementation of the EGTN vision.

Team 2: Functional aspects

The objective of the functional team is to conduct the preparations for the establishment of common procedures and provide detailed rules for authorities' access to e-FTI platforms. The scope of the team's work is making available and processing legally required freight information within the scope of the e-FTI Regulation. The functional team has the ability to perform control tasks within the EU and needs to ensure the confidentiality, integrity and availability of data. The work of this team takes into account all the relevant parties, as it reuses existing IT systems and tries to achieve technological neutrality and future-proof concepts.

The various aspects of this provision can be split into to two parts:

- **Functional** aspects that relate to the establishment of common procedures and detailed rules for authorities' access to e-FTI platforms, including procedures for processing regulatory information made available electronically by the economic operators concerned.
- **Technical** aspects that relate to the establishment of technical specifications.

Team 2 has already published the draft Generic Business Process Model (BPM), which provides a high-level visual representation of the end-to-end freight transport process. More specifically, it contains information on how Economic Operators (EO) will make freight transport information available digitally and how the authorities will retrieve and check this information and archive. This model has great relevance to PLANET and future EGTN development as it can be used as a guideline to include other Regulations outside the EU that are not yet covered by the e-FTI Regulation. This could greatly boost the development of the EGTN and its multimodal networks especially focusing on the new trade routes coming for China and Russia.

Team 3: Technical aspects

The objective of Team 3 is the establishment of the technical specifications in respect to IT infrastructure for the e-FTI platforms. The technical aspects relate mostly to the e-FTI goal of ensuring the interoperability of the IT systems and solutions used for the electronic exchange of freight transport information, and in particular for business-to-administration (B2A) regulatory information communication.

Even though solutions for ensuring technical interoperability exist in abundance, establishing common specifications might prove difficult because, on the one hand the specifications need to be sufficiently precise to create the desired harmonization or even standardization but on the other hand, technological neutrality has to be maintained according to the EIF and the e-FTI Regulation itself. The overall approach of Team 3 can be seen in Figure 14.

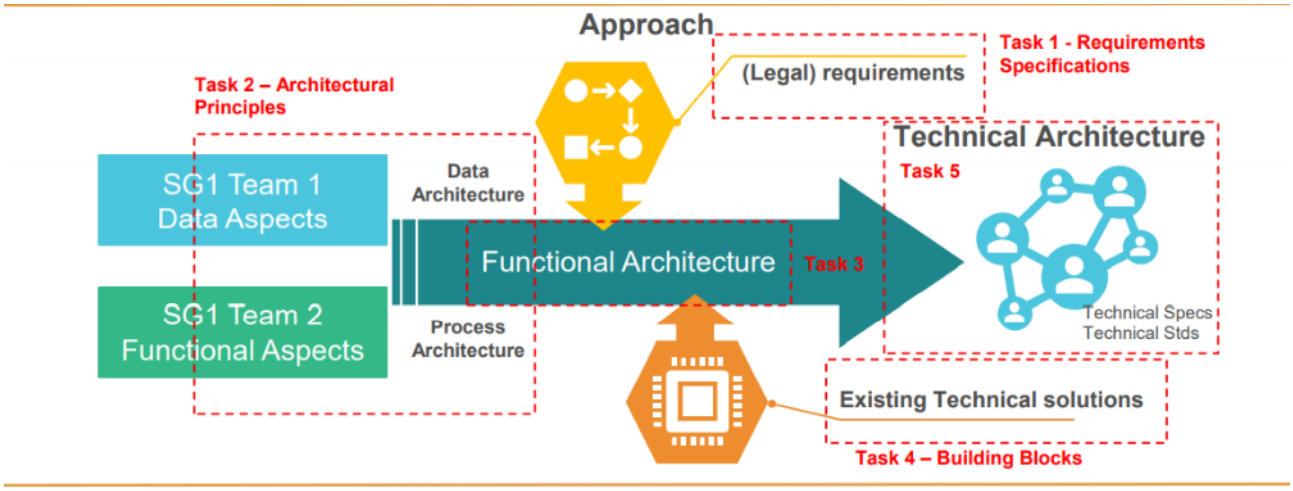

Figure 14: Technical Aspects approach (source: DTLF website)

The output of this Team will be the initial e-FTI architectural principles and their impact on e-FTI architecture and e-FTI building blocks document. This work needs to be aligned with the reference architecture of Subgroup 2 in order to be finalized and ready for use. The architectural principles for the e-FTI platforms will be very important for PLANET as they can be used as reference for other platforms globally during the future development of the EGTN such as to streamline customs procedures from the new trade routes of China and Russia.

Team 4: Certification & implementation

Team 4 will start working soon and the scope of said work will be to fulfil certification requirements and procedure as well as provide proof of certification to the relevant parties. In addition, it will develop public and private sector business cases for e-FTI implementation, set the implementation strategy and plan for the future and finally develop training materials while communicating the results to all relevant EU stakeholders and interested parties. Ultimately, the results of this team will be of vital importance for PLANET, as they will show in real-time how feasible it is in terms of time and cost to apply the e-FTI Regulation across all the Member States and it will generate a path for global implementation.

All the above aspects constitute the four teams of Subgroup 1 and are intended to support the preparation of the e-FTI Regulation's implementation.

5.3.2 Relevance to EGTN development

Overall, the implementation of the e-FTI Regulation is expected to significantly improve the efficiency of the TEN-T network and facilitate the movement of goods within the EU, thus enhancing the economic and environmental sustainability attributes of the future development of the EGTN. EU Member States will follow e-FTI Regulation and specifications when developing national platform solutions for cross-border multimodal information exchange in order to move forward in line with EU. The same approach of standardized data could also be followed globally across the non-EU trade routes during the future EGTN development.

In addition, it will create a much more integrated EU T&L network which will be easier to be further integrated globally both in terms of hard and soft infrastructure. Such a cross-border large scale e-FTI implementation should result in very important lessons learned based on the peculiarities of each EU Member State in terms of differences to the large physical networks as well as the economic, cultural and social standards.

Finally, the impact assessment from the e-FTI implementation within the EU suggests also high economic benefits especially for SMEs while significant environmental benefits from CO2 emissions reductions are also expected, thus positively influencing the impact of the EGTN.

5.3.3 Assessment of policy impacts on EGTN development

The main objective of the e-FTI initiative is to facilitate removing barriers to the smooth functioning of the EU market, to the modernization of the economy and to the greater efficiency of the T&L sector, through enabling wider use of innovation and digital technologies. The impacts of the e-FTI policy can be separated in economic, social and environmental impacts and can be concluded in a more sustainable EGTN development that the existing TEN-T. Detailed analysis on the impact assessment of the e-FTI policy is performed in the next chapter.

5.4 Corridor information systems (Federated Platforms) policy impact

5.4.1 Summary of the Policy

The overall objective of DTLF Subgroup 2 (Corridor Information Systems) is to create a common understanding and solutions for data sharing in supply and logistics that will provide a basis for innovation and cost reduction, and contribute to societal challenges such as safety, security, and sustainability.

In order to achieve this, to be effective and to serve properly the needs of businesses and authorities, the future solution for seamless data sharing should meet specific conditions and prerequisites:

- Be inclusive: it has to be able to support seamless data sharing by every organization, including Small and Medium sized Enterprises (SMEs);
- Support mobility and freight: both mobility and freight can be combined in operations using the same infrastructure and transport means;
- Be available to enterprise and authorities: whereas enterprises share data for their processes, they also have to make data available to authorities for compliance with Regulations;
- Support innovation: future innovations in mobility and logistics should be easily supported by data sharing applications.

It can be seen that the abovementioned prerequisites heavily apply to the future vision of the EGTN in terms of expanding all the necessary conditions to a global, rather than EU, level. In addition, this subgroup is directly related to the innovation attribute of the EGTN since it leverages new technological opportunities that could contribute to the vision of the future development of the EGTN.

Currently, there are numerous existing data sharing implementations for B2B and between B2G and G2B available via a large number of different interfaces that are presently in place. In many cases, large companies and authorities specify their implementation guides based on existing open and international standards, leading to a large number of implementation variants. The issue of multiple platforms and IT systems causes high Total Cost of Ownership (TCO) for those companies and increased complexity, which results in limited flexibility and blocks business innovations like supply chain resilience and agility.

The current approach also lacks inclusiveness. SMEs require high initial costs and increased expertise to invest in the existing method of data sharing, while they need to have ready-to-use IT applications for their daily operations. These applications can be found through multiple platform providers, but depending on their customers, these SMEs may have to connect to many platforms, resulting in higher costs. In short, the need for an open and neutral common data space is of vital importance since the current data sharing solutions are very expensive and not inclusive.

In order to cope with this problem, DTLF Subgroup 2 will propose a technology independent solution that can be implemented by various organizations providing and/or governing commercial services in mobility and freight, using an implementation of choice. More specifically, the proposed solution will integrate existing or emerging platforms into a federated network, thus allowing different stakeholders to easily connect and share their data in a trusted and secure environment by providing the necessary interoperability. It will provide singe access rules, smart digital architecture and a common set of services, following agreed principles of governance in order to overcome the current fragmentation of various IT systems and environments. Each player in the logistics chain will be able to register a single-entry point of their choice,

connect and use services offered by the different platforms and in general conduct their business with minimum effort and costs, without having to bother with specific platform requirements or the complexity of the underlying technology of each platform. Information on logistics services, timetables and capacity availability will be an easy task for the stakeholders. Booking and ordering services or standardized reporting to various authorities will also be a simple task. The ultimate target will be to achieve full supply chain visibility at each and every stage of the logistics chain.

The goal of the initiative of Subgroup 2 is:

1) to develop a **federative platform for data sharing** with two main features:
    a. one single entry point for organizations (business and authorities) based on common, agreed data sharing mechanisms and semantics
    b. built by existing (and future) solutions that have to become interoperable (platforms, peer-to-peer)
2) to replace current interoperability implementations that are too cost intensive, have implementation barriers, are not agile, and block innovation.

DTLF Subgroup 2 addresses two main challenges, the first is the constantly increasing number of data sharing solutions in supply and logistics with different governance structures and business models. The second challenge is the business process integration of organizations in supply and logistics. This issue can be solved at the legal level, possibly supported by a common IT architecture. In order to deal with all of the above, DTLF Subgroup 2 comprises four different building elements as shown in Figure 15.

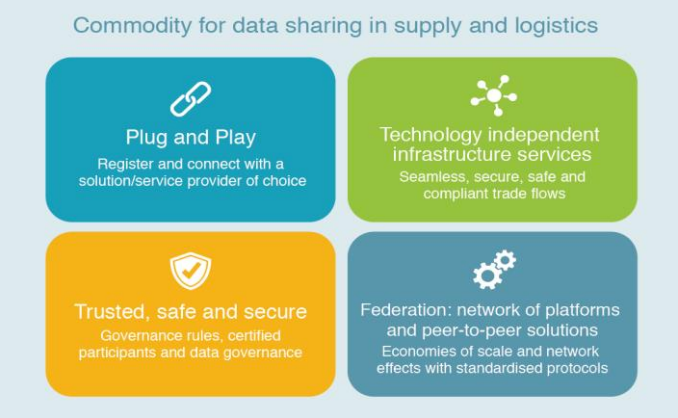

Figure 15: Building elements of the federated network of platforms (source: DTLF website)

Each building element is further comprised of a team. These four teams supplement one another in order to accomplish the same target.

Team 1: Plug and Play

This building block focuses on individual stakeholders, both in the public and private sector, to enable them to register and connect to a platform of their choice and to share data. The overall objective is to provide the ability to do business in digitally with any other company without the need for pre-existing bilateral or community agreements on which specific data to share, compliant with Regulations.

The main features emerged by the previous objective are:

- Discoverability – the business services of all companies are published and can be verified digitally
- Business contract – which part of the digital contract is supported digitally?
- Regulatory compliance – provides for the ability of authorities to access data according to Regulations

- Data transformation – how to transform internal data into DTLF schema (see figure 5), supporting the business contract view and regulatory compliance for goal and business services

Team 2: Technology Independent Services

This team, whose work relates to technology independent services or platform services, prevents a user from being locked on any platform, enabling all users to use the federated platforms including SMEs, and allows platform providers to increase their market share.

The objective of this activity is to provide the technology independent platform services to be offered by the federated platform to support business interoperability for a number of selected business services and ensure their compliance with legislation.

Team 3: Federation of Platforms

The team responsible for federation of platforms or platform interoperability, will establish harmonized connectivity and interoperability among different platforms.

Its objective is to create interoperability between different platforms, even when each platform is developed using different technology. Platform interoperability goes hand-in-hand with technology independent platform services and can be expressed in two layers:

1) Technical protocols – protocols that support platforms in order to actually share data between each other.
2) Functional protocols – support of platform services by each of the interoperable platforms. Functional protocols are further specified in two ways:
    a. Vertical interoperability – two platforms with identical platform services are interoperable.
    b. Horizontal interoperability – two platforms with similar functionality are able to share data, e.g. a logistics marketplace integrates with a booking site.

Team 4: Trust, safe and secure

This team, trusted, safe and secure, will provide general mechanisms such as identity and authentication which ensure trust in the federated platforms, and the technical, legal and organizational governance of the solution.

The objective of this activity is to establish a neutral governance structure ensuring trust, safety and security for data sharing via multiple providers of platform services, including peer-to-peer solutions.

5.4.2 Relevance to EGTN development

The successful accomplishment of the goals of Federated Network of Platforms will provide a clear path and common grounds for multimodal logistics, which is the main target of the EGTN. The development of one basic cross-modal data semantics that will be adopted (specialized) and implemented by each mode of transport and all the supply chain stakeholders will greatly influence the development of the EGTN, having significant impact mainly on the innovation and the integrated attributes of the EGTN. Finally, a migration path provided by supporting existing implementations with various international standards is needed in order to further enhance the future development of the EGTN and to have a significant impact across the global T&L network.

5.4.3 Assessment of policy impacts on EGTN development

The Federated Network of Platforms approach for seamless data sharing will have a positive impact to "green" the supply chain. The greening of transport agenda is challenging the transport and logistics sector to take a leap towards a more integrated approach than today, which is also the among the vision of the EGTN development. Reduction of the environmental footprint of freight transport requires moving the goods by and between different carriers and transport modes as well as providing services to the transported goods. However, in order to make such greening value-adding services available the sourcing of data needs to be facilitated, enabling also global actors to be included. This requires a federated network of platforms in which

data can be shared seamlessly between different organizations and relevant companies. Multimodal data sharing is the basic element for enabling energy efficient transport and a successful implementation of a federated network of platforms will facilitate the development of federated agreements on data sharing which could result in the reduction of the carbon footprint[7].

5.5 Sustainable Finance (EU taxonomy for sustainable activities) policy impact

5.5.1 Summary of the policy

The EU, through the Green Deal, has recognized the importance of environmental sustainability, and in alignment with the Paris Agreement, has set ambitious climate and energy targets for 2030, with an overarching objective of making Europe the first climate-neutral continent by 2050. However, there is a need for a significant transformation of the EU economy to be able to deliver on these climate and environmental sustainability goals, a process which requires major investments. It is estimated that in the coming decades, additional yearly investments of between EUR 175 and EUR 290 billion will be required to reach the Paris Agreement targets[8].

In order to respond to this challenge, the EU is developing the framework for the "Sustainable Finance" policy, aiming to make sustainability considerations an integral part of its financial policy, but also part of the financial decision-making process of private investments (see Figure 16). This Integration of sustainability considerations is expected to redirect private funds, as a complement to public money, towards more climate-neutral, energy- and resource-efficient and circular projects, helping to mitigate the impact of natural disasters as well as environmental and social sustainability issues that can affect the economy and financial markets.

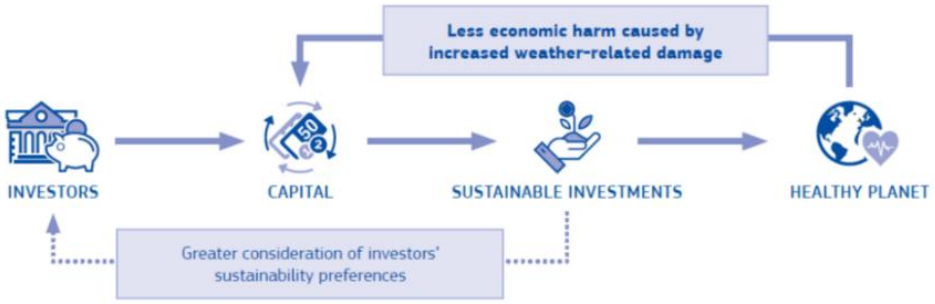

Figure 16: The Sustainable Finance policy rationale[8]

An integral part of the framework for Sustainable Finance is a common classification system for sustainable economic activities in order to have a common language and clear definition of what is considered sustainable.

This classification system, created under the name "EU Taxonomy", establishes a list of environmentally sustainable economic activities based on harmonized EU criteria and is intended to play an important role in helping the EU scale up sustainable investments, thus facilitating the implementation of the European Green Deal. It aims to provide companies, investors and policymakers with appropriate definitions for which economic activities can be considered environmentally sustainable, creating security for investors and protecting private investors from greenwashing. Furthermore, it will help companies become more climate-

[7] Digital data sharing for greener transport in sustainable supply chains - the benefits of establishing a Federated network of platforms (2021). FEDeRATED NETWORK OF PLATFORMS. http://www.federatedplatforms.eu/index.php/activities/27-greening-and-data-sharing

[8] Factsheet: Financing sustainable growth, 18 June 2019. Available at: https://ec.europa.eu/info/files/190618-sustainable-finance-factsheet_en

friendly, mitigate market fragmentation and help shift investments in economic activities that contribute to achieving a climate neutral economy.

The basis for the EU Taxonomy was established through the Taxonomy Regulation (EU 2020/852 - Taxonomy), which was published in the Official Journal of the European Union on 22 June 2020 and entered into force on 12 July 2020. The Taxonomy Regulation set six environmental objectives for the EU Taxonomy, together with four overarching conditions which an economic activity has to meet in order to qualify as environmentally sustainable. Furthermore, the Regulation tasked the Commission with establishing the technical screening criteria, through delegated acts, for each of the six objectives for assessing the contribution of economic activities to the EU's environmental goals.

The environmental objectives of the EU Taxonomy include:

1. Climate change mitigation
2. Climate change adaptation
3. The sustainable use and protection of water and marine resources
4. The transition to a circular economy
5. Pollution prevention and control
6. The protection and restoration of biodiversity and ecosystems

According to the Regulation, in order for an economic activity to be recognized as aligned with the EU Taxonomy for sustainable activities it has to fulfil the following conditions:

1. make a substantial contribution to at least one environmental objective;
2. do no significant harm to any other environmental objective;
3. comply with minimum social safeguards;
4. comply with the technical screening criteria. The technical screening criteria specify the requirements regarding the environmental performance of an activity to ensure that it makes a **substantial contribution** to the environmental objective in question while **not harming significantly** other environmental objectives. The term "substantial contribution" implies that an economic activity either has a substantial positive impact or reduces negative impacts to the environment while "not harming significantly" implies that it does not prevent any of the other environmental objectives from being reached. In this way the coherence between the objectives in the EU Taxonomy is achieved, and progress towards one objective is not made at the expense of another.

It should be noted that the EU Taxonomy recognizes 'green' activities to be those that –besides doing no significant harm and meeting minimum social safeguards –make a substantial, rather than a marginal, contribution to reaching the EU's environmental objectives. The rationale behind this is that because of the significant investment needs and the necessary broad transformation of the EU economy, less than substantial improvements on the current levels of environmental performance, while still important, will in themselves not be sufficient to reach our green objectives.

Based on the above, the first delegated act under the EU Taxonomy on climate objectives sets criteria for economic activities in the sectors that are most relevant for achieving climate neutrality and delivering on climate change adaptation. This includes sectors such as energy, forestry, manufacturing, transport and buildings.

5.5.2 Policy relevance to EGTN development

The PLANET EGTN as a vision of the future TEN-T, including a physical and a technological layer, is closely related to all processes which deal with investments in the transport sector in the EU from both public or private funds. Especially regarding private funds, on 21 April 2021 the Commission adopted a proposal for a Corporate Sustainability Reporting Directive (CSRD) which requires certain large companies to disclose information on the way they operate and manage social and environmental challenges. This proposal amends the existing reporting requirements of the Non-Financial Reporting Directive (NFRD) and:

- extends the scope to all large companies and all companies listed on regulated markets (except listed micro-enterprises);
- requires the auditing (assurance) of reported information;
- introduces more detailed reporting requirements and a requirement to report according to mandatory EU sustainability reporting standards;
- requires companies to digitally 'tag' the reported information so that it is machine readable and feeds into the European single access point envisaged in the capital markets union action plan.

Based on the above, companies that fall under the scope of the CSRD will provide access for investors to information about the taxonomy-alignment of their activities in order to make their investment decisions. Furthermore, this also means that companies with taxonomy-aligned activities may benefit from institutional investors, retail investors and banks interested in green investments, that will be looking to finance taxonomy-aligned economic activities.

5.5.3 Assessment of policy impact on EGTN development

It is expected that the implementation of the EU Taxonomy will have an impact on future private investment initiatives related to the TEN-T, regarding hard infrastructure (ports, inland terminals, road charging stations etc.) or the implementation of digital solutions.

Despite there being no obligation for companies to have activities aligned with the EU Taxonomy and no obligation for investors to invest in taxonomy-aligned activities it is highly likely that **there will be greater interest in taxonomy-aligned activities from investors who are seeking green investments.** This in turn is expected to cause an increase in the available funding from public and private investors and thus contribute to the development of infrastructure and technologies that **will facilitate the realization of the green aspect and the environmental sustainability and resilience attributes** of the EGTN. Evidence from the above is the inclusion in the economic activities of the transport sector in the first delegated act under the EU Taxonomy of infrastructure related to rail and inland water transportation.

Furthermore, although the EU Taxonomy is not binding upon non-EU financial market participants (unless they are active in EU markets), it is possible that foreign investors may use the taxonomy to assess whether an investment contributes to an environmental objective such as climate change mitigation or adaptation. It is also possible that investments in activities that would not qualify under the EU Taxonomy, but are promoted as environmentally friendly, may be subject to more scrutiny by investors or regulators.[9] It should also be noted that there are ongoing discussions with third countries to scale up Sustainable Finance globally.

[9] https://corpgov.law.harvard.edu/2020/06/10/the-ripple-effect-of-eu-taxonomy-for-sustainable-investments-in-u-s-financial-sector/

5.6 Preliminary qualitative assessment of the impacts of the DTLF policies

In order to assess the impact of the DTLF policies, a questionnaire survey was sent to a group of experts and the results are presented and analyzed in this section. The participants of the survey were carefully selected based on their expertise in the transport and logistics sector; many of them are DTLF members and they closely follow the actions of the second mandate. The questionnaire can be found in Annex III. The assessment is two-fold:

- on the one hand, a qualitative analysis of the impact that the DTLF policies, namely paperless transport and the corridor information systems, will have on business processes based on the estimations performed within the expert group, and
- on the other hand, the impacts on the attributes needed for the EGTN vision to be realised is also assessed in order to be able to select those to be translated later to reference specifications and policy recommendations. Where possible, the results were supplemented with quantitative expected impacts collected from EU relative documents.

First, the participants were asked to estimate the adoption rate of the current DTLF policies until 2030. The expected adoption rate of the DTLF policies is presented in Figure 17:

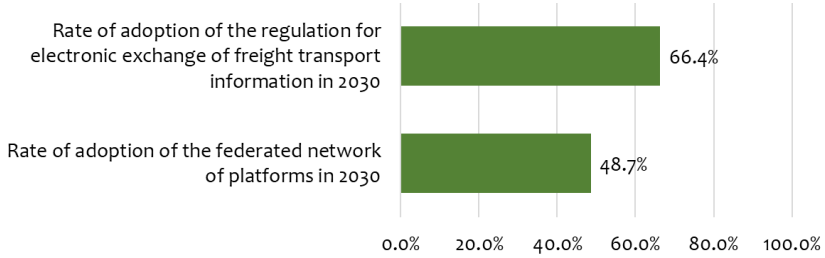

Figure 17: Expected rate of adoption of the DTLF policies

It can be seen that e-FTI is expected to have higher adoption rate in 2030 compared with the Federated Network of Platforms. The responses reveal a belief that comes from the fact that the e-FTI Regulation has been approved by the EU and work is underway to assist the Member States with the implementation. On the other hand, the projected adoption rate of 66.4% in 2030 could be characterized as a relatively low score for an already passed Regulation showing that the Member States may still not be ready to transform to full digitalization of freight documents. Regarding the federated network of platforms, the foreseen adoption rate of 48.7% is as characterized relatively optimistic taking into account that there is not yet an official Regulation and the activities of the DTLF are still in progress.

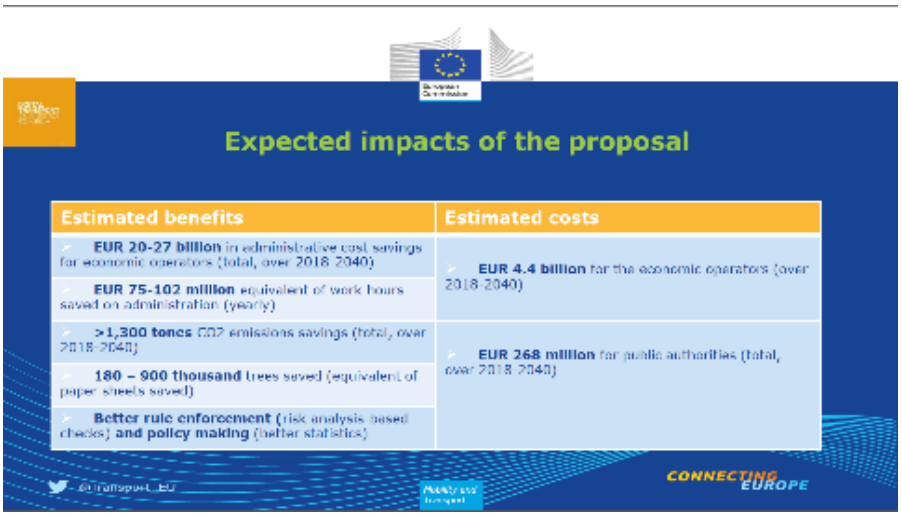

Figure 18: Results of the EC estimation of the benefits and costs of the implementation of the paperless transport (source: EC main presentation 15/01/2019)

5.6.1 Impacts on business processes from DTLF Policies

DTLF Subgroup 1: Paperless Transport

The DTLF policies are expected to have significant positive impacts on the business processes of the companies that will adopt them and also in the environment which will benefit from the full digitalization of the transport documents. In addition, the initial estimated costs for the economic operators and the public authorities are presented as highlighted from the DTLF outcomes. More specifically, the expected benefits over the estimated costs are shown in Figure 18:

Based on the estimations above, the survey was conducted to further qualitatively assess the impacts of the implementation of paperless transport. The questions focused on the following impacts:

- Administrative cost savings
- Saving of work hours spent on administrative procedures
- Reduction of environmental impact (CO2 emissions)
- Better rule enforcement (risk-analysis based checks)
- Facilitation of policy making (availability of better statistics)
- Increase of business opportunities for IT companies
- Reduction in fraud/corrupt practices
- Increase of data accuracy

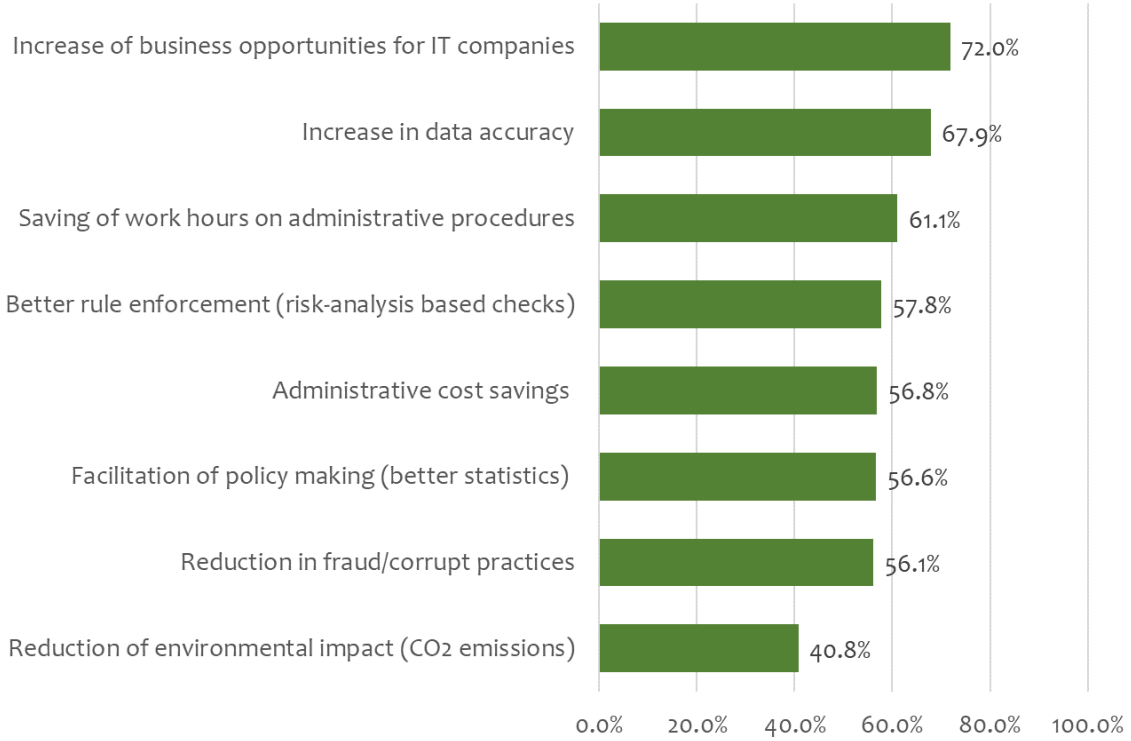

Figure 19: Results of the preliminary assessment of e-FTI impacts on business processes

From the results presented in Figure 19 above, it can be seen that the most important impact from the implementation of e-FTI within the EU will be the increase of business opportunities for IT companies (72%) which reflects the ambition that the need for development and alignment with the certified e-FTI platforms will create new business opportunities as the companies across EU should try to adapt to the e-FTI Regulation. A similar positive impact is predicted by experts on data accuracy (67.9%), which shows increased trust in the digitalization of freight documents, which inevitably will decrease the error rate in the information being circulated through e-FTI platforms. Furthermore, the responses for most of the remaining expected

impacts seem to be rather mediocre, showing the significance of the expected positive impacts and the uncertainty of whether any of the impacts will have a significant influence on the business processes. Finally, it is worth mentioning that the respondents seem to believe that the EU's carbon footprint will not be significantly affected by the e-FTI implementation (40.8%). This statement comes in contradiction of the EC's official position on the expected impacts of the e-FTI proposal, in which the environmental aspect plays an important role.

DTLF Subgroup2: Corridor information systems

The existing data sharing solutions are too many and, too expensive, and lack inclusiveness and most importantly, interoperability. Interoperability of data sharing will enhance supply chain visibility and building capabilities, and enable synchronized operation planning for a responsive resilient, secure, safe, and multimodal transport ecosystem, that would bring significant benefits to relevant stakeholders. The potential expected benefits from the adoption of the Federated Network of Platforms for the relevant stakeholders can be summarized as follows[10]:

- Shippers and consignees will exchange products across a reliable, sustainable multimodal logistics network according to goals that they have agreed among themselves. They will have full transparency/visibility regarding their product flow according to goods flows that meet their requirements.
- Logistics Service Providers will have full visibility of alternative multimodal transport solutions based on (predicted) available capacity and quality of the underlying physical infrastructure. With this, they can manage logistics chains via a single-sourced system, sharing data electronically with carriers and other players along the entire supply chain.
- Carriers will gain visibility of demand patterns, which will allow them to improve capacity utilization, align service design and capacity planning as well as advance dynamic chain scheduling. In this way they can optimize positioning of their assets according to predictable demands of shippers and consignees.
- Law enforcement agencies like customs and other inspection authorities will have direct access to and be able to receive (push) or retrieve (pull) relevant data for performing their tasks.
- Infrastructure providers will be able to optimally predict and coordinate traffic flows, allowing them to make timely investments in upgrading infrastructure.
- The emergence of multimodal transportation networks with full integration into capacity and production planning systems.
- Multinational companies will be able to effectively integrate multimodal transport systems into their production systems to provide advanced services and lower costs.

Based on the above benefits, the participants were asked to assess those impacts on their business processes and the results are shown in Figure 20.

[10] DTLF Sub-group 2: Enabling organisations to reap the benefits of data sharing in logistics and supply chain, Executive summary of the final report. June 2018.
https://www.dtlf.eu/sites/default/files/public/uploads/fields/page/field_file/executive_summary2_reading__0.pdf

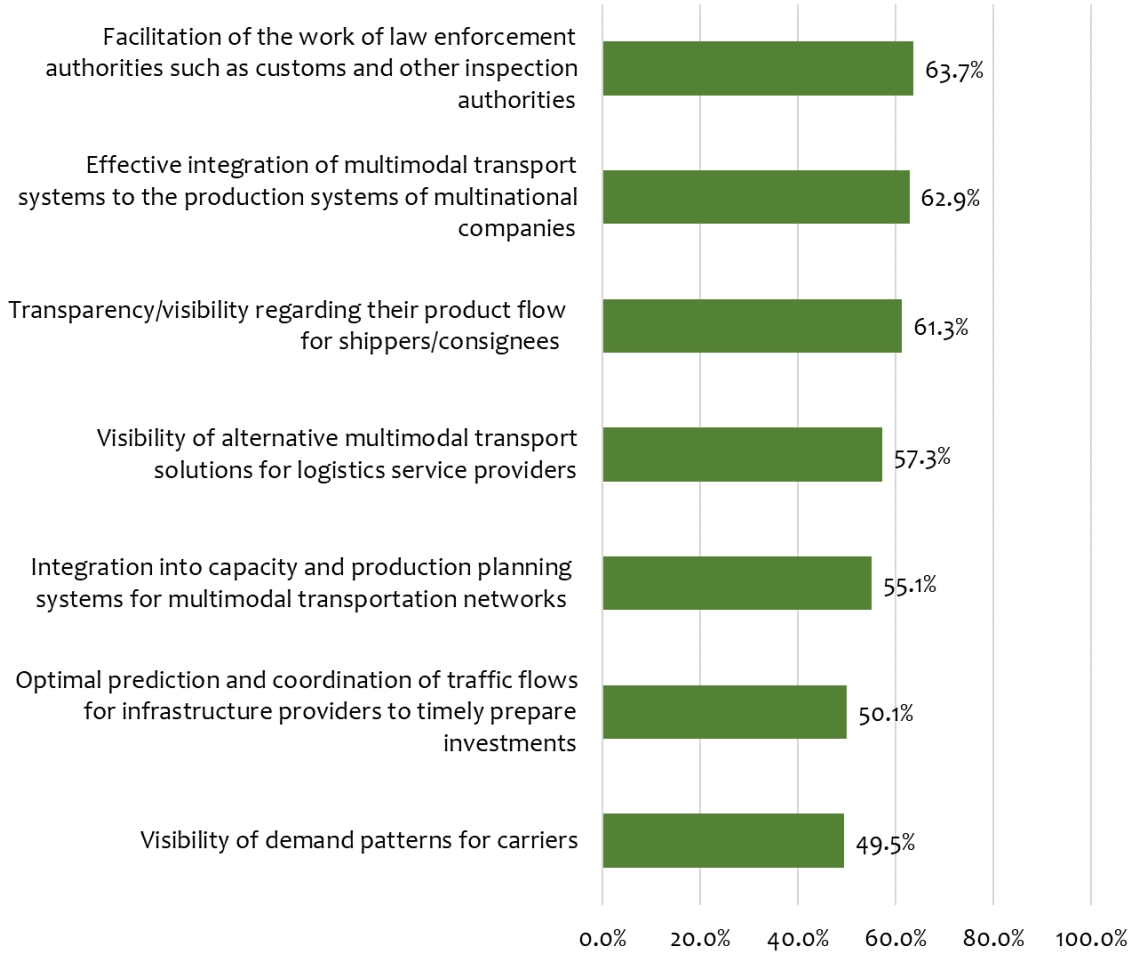

Figure 20: Results of the preliminary assessment of Corridor information systems impacts on business processes

It can be seen that all the potential benefits are almost equally important in the experts' opinion, thus showing that the stakeholders consider the adoption of the Federated Network of Platforms a very important future element for their businesses. More specifically, the facilitation of the work of law enforcement authorities will have the biggest positive impact (63.7%), which reveals that the work of customs and other authorities still cause a lot of operational delays in the transport and logistics sector. In addition, the effective integration of multimodal transport systems into the production systems of multinational companies seems to be the second most important impact (62.9%), which could directly and positively influence the EGTN's future development, since the EGTN focus on new trade routes that are dominated by multimodal freight transportation.

5.6.2 Impacts on EGTN attributes from DTLF policies

The second part of the survey was dedicated to the impacts of DTLF policies on the EGTN attributes, with the aim of understanding how the implementation of EFTI and the Federated Network of Platforms will impact the specific attributes (Geo-economics awareness, innovation, impact, integrated, inclusive) of the EGTN. The first question for each DTLF subgroup aims at validating the proposed impacts on the EGTN attribute components. We identified twelve (12) components that are the prerequisites to validate the abovementioned EGTN attributes. These components can be summarized as follows:

Geo-economics aware:

- Ability of EGTN to capture and take into account for its development changes in freight flows caused by geo-economic parameters (e.g. regionalization of production and the development of new entry points to the TEN-T
- Resilience of EGTN corridors through facilitating multimodality
- Ability of EGTN to alter corridor capacity in order to respond to changes in demand for transport

Innovation:

- Introducing and exploit innovative technologies (Blockchain, IoT, AI, 3D printing etc.) in logistics operations on the EGTN
- Implementation of the Physical Internet concept (PI containers, PI nodes, PI moves, etc.) to corridors of the EGTN

Impact:

- Economic sustainability and efficiency of logistics operations on the EGTN in terms of resource and labor usage and transport &logistics cost
- Carbon footprint of logistics operations on the EGTN through the visibility increase allowing for efficiency (e.g. better use of resources) and continuous monitoring and environmental assessment of operations)
- Social sustainability across EU, promoting social equity regarding employment opportunities in the Transport and Logistics sector across EU and along EGTN, including disadvantaged regions

Integrated:

- Efficiency of processes (e.g. customs clearance) and the seamless transportation of goods across borders during global logistics operations and along EGTN global corridors
- Interoperability of rail infrastructure & processes across borders along EGTN global corridors

Inclusive:

- Data availability of the transport and logistics industry operations, enabling rational planning of EGTN, efficient monitoring of infrastructure and services and fair development of TEN-T, decreasing inequities among regions
- Ability of EGTN to secure a minimum level of accessibility to disadvantaged and remote regions of EU

The second question assesses the level of impact (either positive or negative) on the EGTN attributes. The validation of the proposed impacts of EFTI implementation on the EGTN attribute components is shown in Figure 21.

DTLF Subgroup 1: Paperless transport

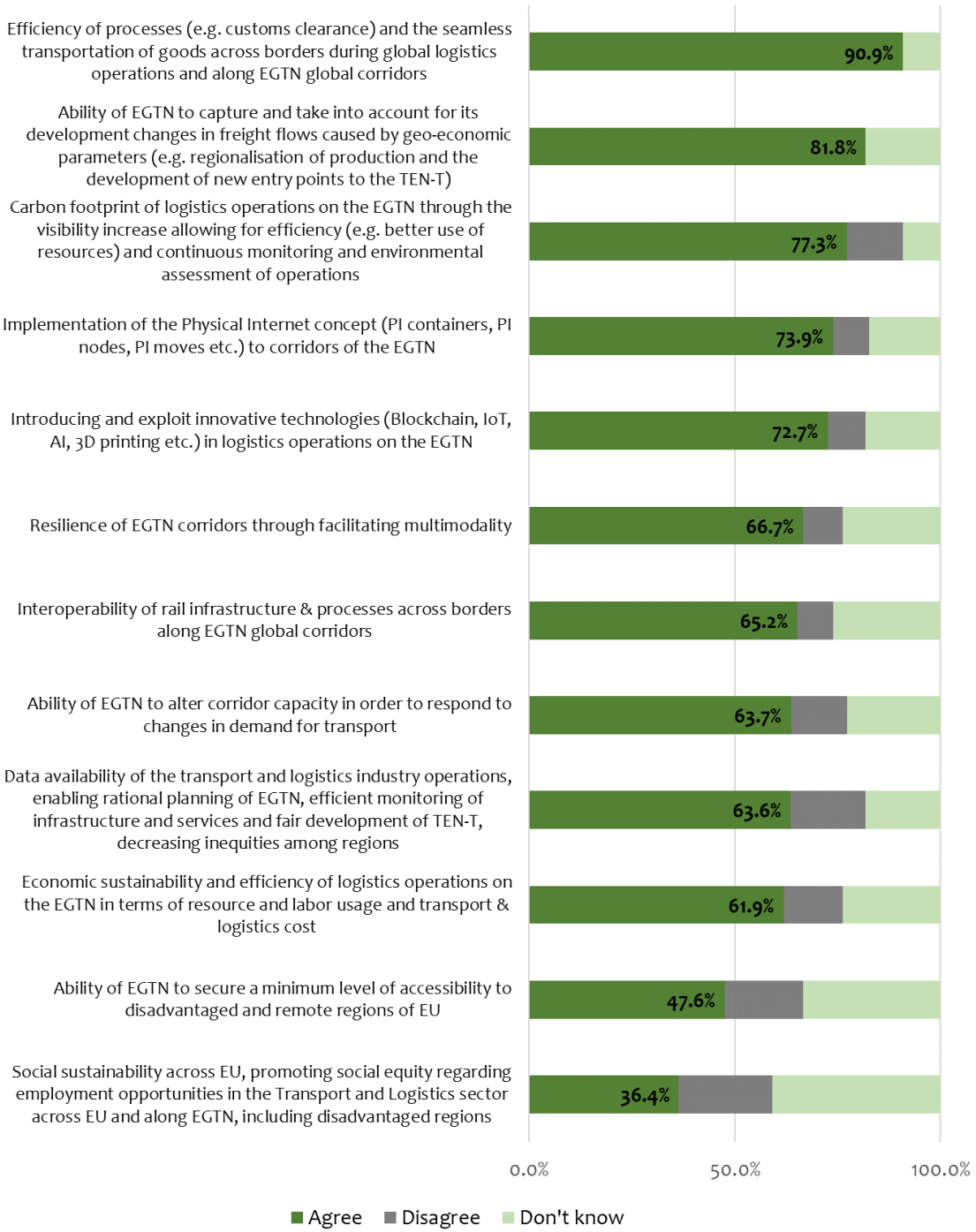

Figure 21: Validation of the proposed impacts from e-FTI on the EGTN attribute components

It can be seen that the vast majority of the respondents (90.9%) agree that e-FTI will have an impact on the efficiency of specific processes, such as customs clearance, and the seamless transportation of goods across borders during global logistics operations and along EGTN global corridors, which indicates the necessity of EFTI implementation for the EGTN's future development. In addition, most of the respondents (81.8%) believe that e-FTI will have an impact on the ability of the EGTN to capture and take into account for its development changes in freight flows caused by geo-economic parameters. For example, the foreseen regionalization of production and the development of new entry points to the TEN-T network will be heavily impacted by the locations that are the first to adopt e-FTI. Moreover, the experts agree that most of the remaining EGTN attribute components are truly expected to be impacted by e-FTI implementation.

On the other hand, many of the experts disagree with or were unsure about the statement that implementation of e-FTI will have an impact on social sustainability across the EU. In addition, fewer positive opinions were expressed in response to the statement that e-FTI will have an impact on the ability of the EGTN to secure a minimum level of accessibility to disadvantaged and remote regions of the EU. It seems that the respondents believe that the implementation of the e-FTI will focus mainly on more conveniently located regions, for freight transportation, across the EU, and will not upgrade other more remote regions.

Figure 22 assesses the level of impact, either positive or negative, of e-FTI implementation on the EGTN attributes.

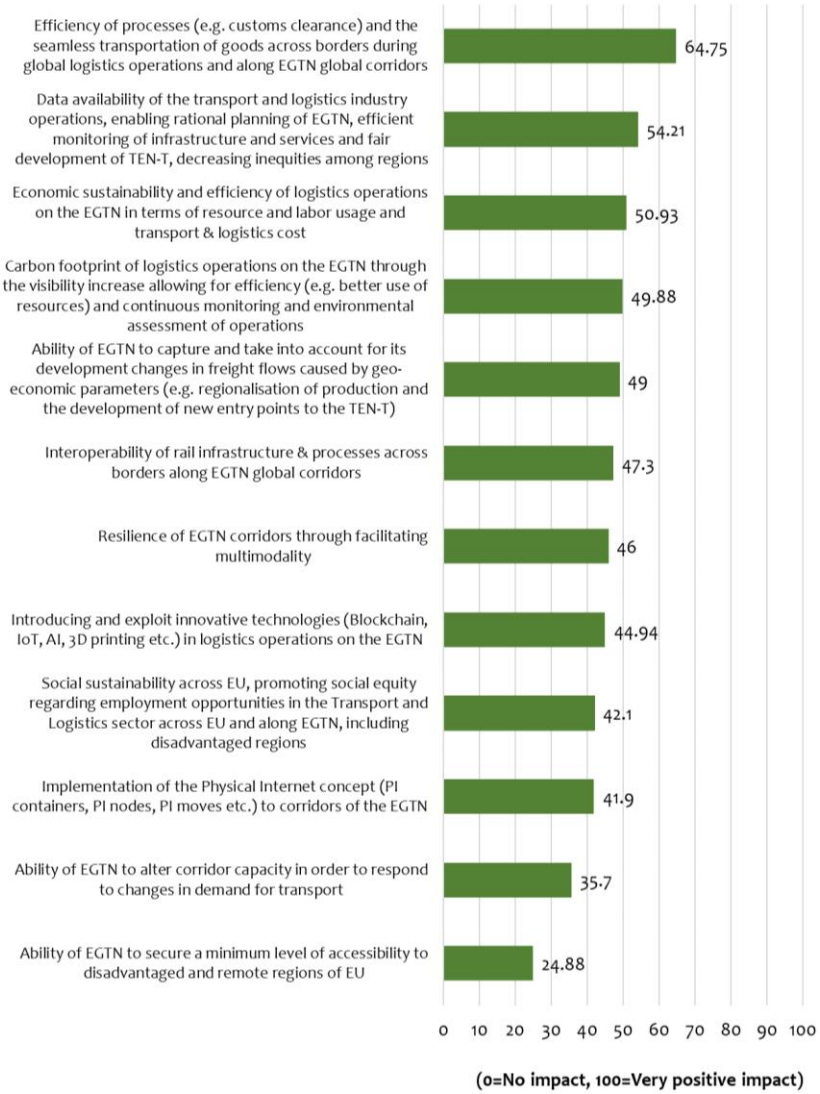

Figure 22: Level of impact from implementation of e-FTI on the EGTN attributes

It can be seen from the responses that the most positive impact is expected to affect the integrated attribute of the EGTN, since the overall efficiency of processes and the seamless transportation of goods across borders will be key elements for the future development of the EGTN. In general, it seems that the implementation of the e-FTI will have a positive impact on all EGTN attributes. More specifically, the bigger positive impact will be in the integrated attribute in which e-FTI could provide a link between EU Member States and the global network. In addition, e-FTI will also have a considerable positive impact on the inclusive EGTN attribute through the data availability of T&L industry operations, facilitating data accessibility to disadvantaged regions, resulting in the development of regional workforce skills. Finally, it is evident that the e-FTI will have a comparably less positive impact, according to the respondents, on the innovation attribute, indicating that

innovative logistics concepts such as PI, and technological innovations will not be heavily influenced by e-FTI implementation.

DTLF Subgroup2: Corridor information systems

The validation of the predicted impacts of the Federated Network of Platforms' implementation on the EGTN attribute components is shown in Figure 23. Again, it can be seen that almost all of the proposed impacts are valid, according to the responses of the participants. More specifically, the vast majority of the respondents agree that the implementation of the Federated Network of Platforms will have an impact on the efficiency of processes (80.9%) and the ability of the EGTN to capture and take into account potential changes in freight flows (80%). In addition, the participants validated all the highlighted impacts except for social sustainability across the EU, on which the lowest percentage of respondents agreed (47.6%). In total, we can conclude that there is general agreement that the implementation of the Federated Network of Platforms will have multiple impacts on the EGTN attribute components.

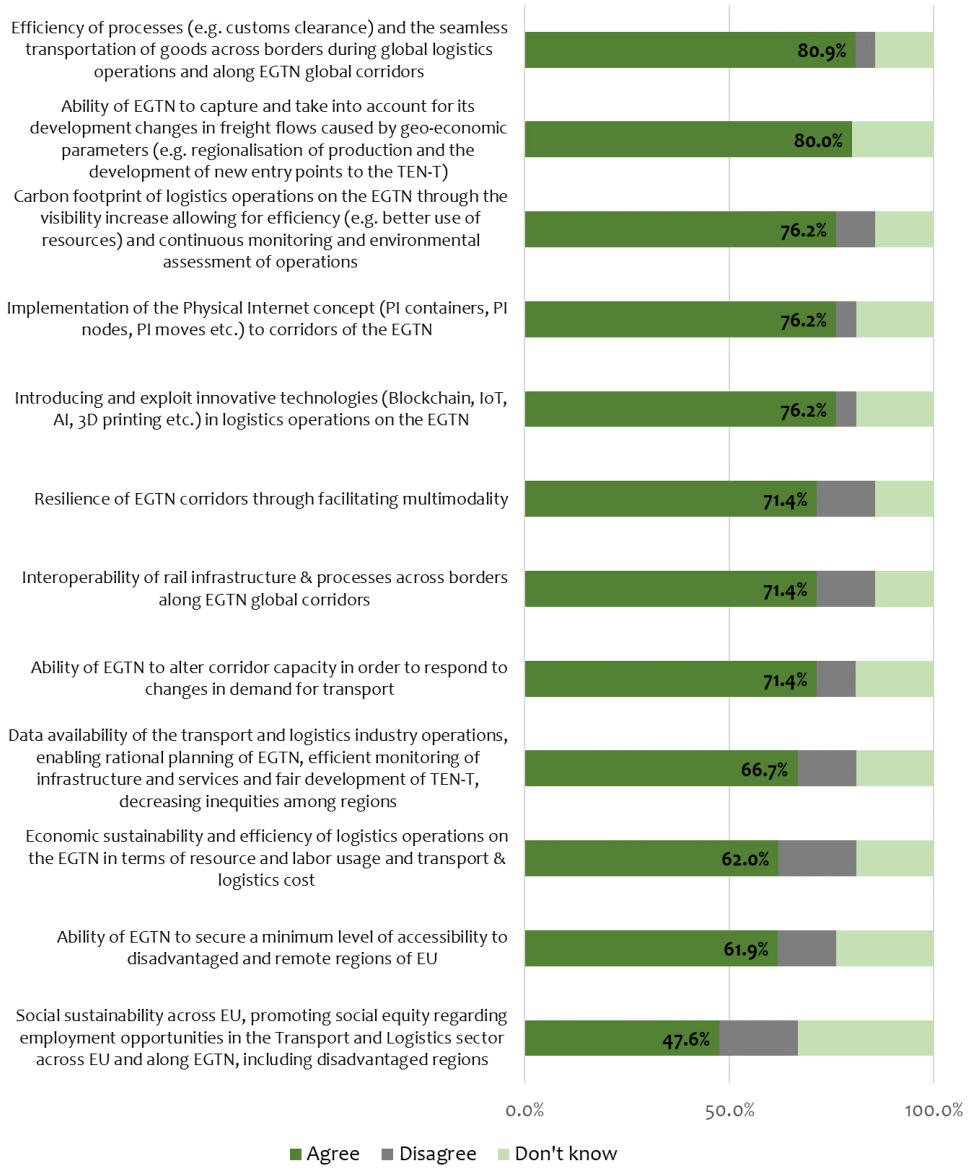

Figure 23: Validation of the predicted impacts of the Federated Network of Platforms on the EGTN attribute components

Moving on to the assessment on the level of impact of the Federated Network of Platforms to the EGTN attributes (Figure 24), it is obvious that the most positive impact will be on the integrated attribute of the EGTN. More specifically, it is expected that the implementation of the Federated Network of Platforms will greatly impact the interoperability of rail infrastructure and processes across borders throughout the EGTN global corridors, thus facilitating the transition to multimodality across the global network. In addition, equally positive impact to the integrated attribute of the EGTN is expected to have to the efficiency of processes such as customs clearance, which will provide a significant boost to the seamless transportation of goods across borders along the EGTN global corridors, thus improving the overall logistics soft infrastructure. Finally, we can conclude that the predicted components will have a positive impact on all the EGTN attributes, which means that the successful implementation of the Federated Network of Platforms will greatly assist PLANET's vision for future EGTN development.

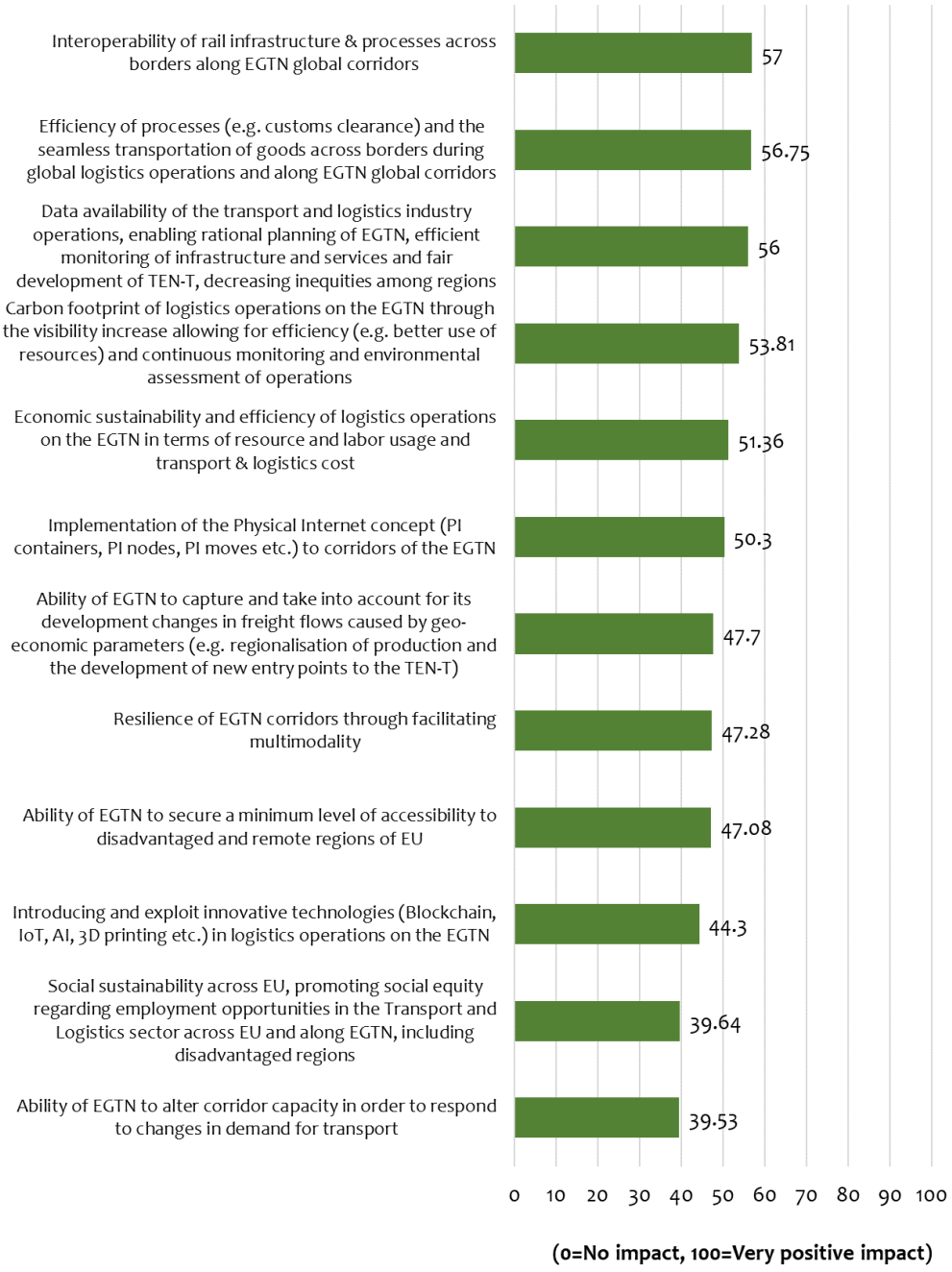

Figure 24: Level of impact from implementation of Federated Network of Platforms on EGTN attributes

Comparing the responses of the respondents about the impacts of the DTLF policies on the EGTN attributes, a series of significant remarks can be extracted. The most important remarks are summarized as follows:

1. The implementation of the e-FTI will have greater positive impact on the integrated attribute of the EGTN than the Federated Network of Platforms in terms of efficiency of processes and the seamless transport of goods across borders. Although in both questions the positive results were above the average, the participants rated the e-FTI as more significant for the integrated attribute of the EGTN. However, the implementation of the Federated Network of Platforms will have a greater positive impact of the integrated attribute of EGTN than the e-FTI in terms of the interoperability of rail infrastructure and processes across borders along the EGTN global corridors. In total, it can be seen that both policies are expected to have their biggest positive impact on the integrated attribute of the EGTN.
2. It is expected that the implementation of the Federated Network of Platforms will more positively impact the ability of EGTN to secure a minimum level of accessibility to disadvantaged and remote regions of EU than the e-FTI, although both positive responses were below the average positive rate.
3. The expert's expectation is that the implementation of the Physical Internet concept to corridors of EGTN will be facilitated more from the implementation of the Federated Network of Platforms than from the e-FTI. This results in greater impact on the innovation attribute of the EGTN from the foreseen federation of platforms, rather than the e-FTI implementation.

5.7 Selection of impacts to be fed into simulation

The EU policy initiatives which were presented in the previous chapters of this document are expected to affect the realization of the EGTN vision through their impact on the identified components required to achieve the five EGTN attributes (geo-economic awareness, innovation, impact, integrated, inclusiveness). Some of the identified impacts have the potential to affect the EGTN development in a way that will alter the freight flows in the transportation network. For this reason, it is imperative that these impacts are also taken into account in the simulation process of the future scenarios which were developed in the context of the project and aim to predict the future transport flows within EU and between China and Europe.

The purpose of this chapter is to perform a preliminary selection of the impacts of EU policies which are expected to affect the flows in the EGTN and thus should be included in the PLANET simulation model(s) and also the modelling parameters to which these impacts relate to.

In order to perform this task, a two-step process was followed:

1) identification of the EU policy impacts on the EGTN attributes which have the potential to significantly alter the flows on the EU transportation network and therefore need to be used as an input for the macro simulation model(s), and

2) identification of the model parameters which can quantify these impacts in order to be used as input to the simulation model(s).

Regarding the main parameters which are used by the macro simulation model(s) of PLANET, these are related to the cost model for each of the modes of transport (which generate an O-D matrix for each mode) and include parameters such as the various costs (e.g., labour, capital, fuels), the speed (based on infrastructural characteristics), the load factor and the location of terminals (for rail and IWW transport). Furthermore, other parameters also used are related to the reliability, the security of modes, the value of time and the attractiveness per terminal.

Based on the analysis of the EU policies, the results of the questionnaire survey and taking into account the model parameters described in the previous paragraph, the following impacts are selected to be fed in the PLANET simulation model(s), presented together with the modelling parameters to which they relate to:

- The increase of the ability of EGTN to capture freight flows development caused by geo-economic parameters such as the regionalization of production and to consider them in improving network

operations and the decision making for infrastructure development, is expected to affect the parameters related to the location and capacity of terminals and also the attractiveness of terminals, especially the rail terminals located in Eastern Europe where the entry points for the land flows from China are located. Furthermore, it is also expected that the optimized network and operations which will result from the increased ability of EGTN to capture freight flows development, will also have an impact on the cost and speed parameters of the model.

- The increase of the resilience of EGTN corridors through the facilitation of multimodality is expected to affect the speed and cost parameters, together with the reliability and security parameters of the model. This has become evident from the recent incident in the Suez Canal, when the immobilization of a container ship and the blockage of the trade route for a few days resulted in significant costs and delays and the overall disruption of the smooth operation of the supply chains.
- The increase of the ability of EGTN to adapt corridor capacity in order to respond to changes in demand for transport is expected to result in the decrease of bottlenecks and thus ensure smooth flows on the transport network and high level of services. This will in turn will have an impact on the speed, the cost and also to the mode reliability parameters of the model.
- The facilitation of implementation of the Physical Internet concept (PI containers, PI nodes, PI moves etc.) to corridors of the EGTN is expected to result in a more environmentally sustainable and economically efficient network. According to ALICE, it is estimated that in the case of full implementation of the PI concept to the EU transportation network, the foreseen increase of demand for transport by 300% will be met by only 50% increase in the assets. Therefore, achieving this attribute of the EGTN will affect both the cost and speed parameters of the model, in relation to the extent of the PI implementation, to corridors/regions or the entire EGTN.
- Similar to the implementation of the PI concept, the facilitation of introduction and exploitation of innovative technologies (Blockchain, IoT, AI, 3D printing etc.) in logistics operations on the EGTN will result in a significant efficiency increase, affecting both the cost and speed parameters of the model for the mode(s) of transport which will benefit from their use.
- The increase in the level of economic sustainability and efficiency of logistics operations on the EGTN in terms of resource and labour usage will affect the cost parameters of the model.
- The increase of the efficiency of processes (e.g., customs clearance) and the seamless transportation of goods across borders during global logistics operations and along EGTN global corridors will affect significantly the speed parameter of the model, especially for rail transport but also the cost parameters due to the decrease in transportation time.
- Similar to the increase of efficiency of processing during global logistics operations and along EGTN global corridors, the increase in the interoperability of rail infrastructure & processes across borders along EGTN global corridors is expected to have a significant impact on the speed and also the cost parameters of rail transport of the model.

These impacts and their corresponding modelling parameters will be further analysed and specified in cooperation with the model-developer partner of the project in order to be used in the simulation of the future scenarios. The results will be presented in the final version of the document.

6 Key implementation barriers

6.1 Definition and classification of barriers faced by legislative initiatives

EU and international legislations are designed to set fair and transparent framework conditions for all transport modes (road, rail, inland waterway, maritime) aiming at putting all modes under the same playing field and more recently at greening drastically the land transport modes with the publication of the Green Deal by the European Commission and endorsed by the European Parliament. The following chapter presents the key implementation barriers arising from the abovementioned EU and international legislative actions. These barriers are classified according to the three dimensions of the EGTN (infrastructure, technological and governance).

6.1.1 Layer 1 – EGTN Infrastructure

Most of the identified legislative initiatives are covering infrastructure parameters for the different transport modes and are fixing the operational measures to manage those infrastructures in the most efficient ways. The list of the most significant existing and potential barriers in the implementations are highlighted below.

- **Significant delays in the implementation of the legislation (or even no implementation at all)**
  The time between the official publication of a legislation and the implementation into national law might take much more time than expected (even if the legislation includes an official implementation deadline). In some cases, the legislation is not all implemented (CT Directive for example). This causes a disruption in the realisation of European and international interoperable networks.

- **No mandatory requirements but only voluntary agreements**
  Some international agreements (AGT, AGTC) are considered as a willingness of the signatories to follow the principles laid down in the Regulations (catalogue of plans). It is therefore up to the signatories to implement or not those intentions.

- **Harmonised infrastructure parameters are defined in various legislations but would need some adjustments and alignments**
  Some legislations are old (AGT, AGTC) and would need to be adjusted to the most advanced initiatives whereas some legislations are covering the same parameters (TEN-T, Rail Freight Corridors) with different values should be aligned and harmonised.

- **Huge delays in the realisation**
  The upgrades and/or the creation of new lines require in some cases significant infrastructure investments that require a long decision-making process at national level and therefore cause in some case huge delays in the realisation even with the creation of specific funding infrastructural schemes at international, European and national levels

- **Single modal approach and lack of intermodal compliance**
  The analysed legislative initiatives are based on a single mode approach and very often on a single corridor principle without integrating the concept of a real transport network and intermodality. This causes very often distortions among transport modes and does not allow for the full potential of modal shift to more sustainable modes such as rail for example.

6.1.2 Layer 2 – EGTN Technological

According to the EGTN definition the technological layer comprises the following components: (1) technologies monitoring assets & processes of companies (IoT,..,) along the physical EGTN infrastructure, (2) connectivity to digital infrastructure available at corridors and nodes (inside & outside EU) and to federated public and private platforms, (3) EGTN solutions available for managing the physical & digital infrastructure of the network, data Analytics & aggregation of data resulting from PI services for feeding Indices calculation for supporting public & industry decision making and (5) sychromodality modelling & PI simulation for supporting Industry decision Making.

Very few identified analysed legislative initiatives are directly impacting the second layer of the EGTN except in promoting and facilitating the digital data exchange of transport-related information (mainly the consignment note and customs). The list of the most significant existing and potential barriers in the implementations of those initiatives are highlighted below.

- **Need for effective coordination between institutions on the Eurasia routes for data interoperability**
  Different Regulations (such as CIM and SMGS) define the minimum requirements related to consignment note data. A common CIM/SMGS consignment data specification exists to facilitate the exchange of data but need an improved coordination between the respective institutions such as the Commission, OTIF and OSJD. A full digital interoperability of consignment-related data is necessary.

- **No digital document platform (transport, customs) is in place on the Eurasian routes**
  The stakeholders need to exchange the transport and customs data on a B2B basis without benefiting from commonly developed digital platforms. The non-implementation of such platform causes a lot of additional administration and affects the overall efficiency of the operations on the Eurasian routes.

- **Lack of adequate supervision by Authorities**
  For any legislation the European and international Authorities should verify if it has been rightfully implemented. For example, the Implementing Regulation on access to service facilities and rail-related services has been published in 2017 but the Railway Regulators do not use sufficiently their supervision authority if the stakeholders have been compliant with the Regulation. The same can be applied on the implementation of the CT Directive.

6.1.3 Layer 3 – EGTN Governance

The governance layer consists of the ecosystem of stakeholders interacting and collaborating for developing and sharing T&L infrastructure and participating in the decision making of the EGTN. It also includes all the corridor governing schemes and monitoring of the performance of corridors and nodes of the EGTN.

The following two legislative initiatives are covering the 3rd layer of the EGTN: the TEN-T Regulation and the Rail Freight Corridor (RFCs). The list of the most significant existing and potential barriers in the implementations of both initiatives are highlighted below.

- **Limitation of the possibility for Member States to ask for derogations to the established TEN-T or RFCs parameters**
  As the main aim is to create harmonised and interoperable networks in EU, Member States should have limited options to deviate from the prescribed parameters. The current options are providing too much flexibility to Member States and thus not promoting enough a global EU approach.

- **Investors are reluctant to submit proposals as single European One-Stop-Shops are not yet in place at national level**
  The easy accessibility to infrastructure funding should be supported by a release of administrative burdens for the investors by offering European and national one-stop-shops for any questions related to investments related to TEN-T and/or RFCs.

- **Lack of business-oriented comparable harmonised set of KPIs on all corridors**
  For both legislative initiatives, KPIs have been designed and validated by the governance structures. However, they should be more business-oriented to be more efficient in the future and should be not serving the interest of one single stakeholder such as the railway infrastructures.

- **Lack of communication and dissemination**
  The public accountability of corridors is lacking, as not only their transparency is inadequate but the opportunities for the wider stakeholder base to engage the management as well as the Management and Executive boards is also non-existent. Annual or bi-annual general meetings should be organised by each corridor and should be open to any stakeholder who may be able to prove their involvement and interest in the corridor. These meetings should provide an opportunity to review the performance of the corridor and its development and bottleneck removal plans.

- **Underestimated roles of some key actors**
  The current governance structures are in some cases one-way communication venues, where participants may learn about decisions, or expected changes, but have limited means to influence their outcome. The roles of some working groups need to be reinforced (for example the RAG/TAG meetings within the RFCs).

6.2 Definition and classification of barriers faced by DTLF policy initiatives

EU policies may be established with the intention of them becoming future Regulations and legislations, but in practice there are some key implementation barriers that may affect the adoption of these policies in the near future. The following chapter presents the key implementation barriers arising from the abovementioned EU policies that may hamper their adoption in the future. In addition, the barriers to adoption of the DTLF policies will be classified based on a survey shared among 24 logistics experts and members of the DTLF.

A possible delay in the adoption of the DTLF policies within the EU will significantly influence the improvement of the existing TEN-T T&L network and subsequently hamper PLANET's vision on the future development of the EGTN.

6.2.1 Electronic Freight Transportation Information (e-FTI)

The implementation of the e-FTI Regulation set for 2025 will bring significant benefits to the relevant stakeholders, either SMEs and other private organizations or public authorities and administrations. Despite the fact that there are numerous obvious benefits offered by the e-FTI for the T&L network, there are also some significant barriers that could jeopardize the wider adoption of the e-FTI within the EU.

The list of the most significant potential barriers in the adoption of the e-FTI is highlighted below.

1. **Initial high compliance cost for the transition to paperless transport**

Different formats and implementation guides of standards among both private companies and public authority stakeholders could lead to relatively high costs for implementation and maintenance of digital links by individual stakeholders. For example, dominant companies as well as port and airport communities have different implementation guides for the same or differing standards. Each separate implementation guide for a specific standard requires additional implementation costs for individual companies and authorities, thus making compliance costs too high.

2. **Uncertainty as to whether or not an electronic transport document will be accepted by authorities, banks, insurance companies and courts**

It is well known that, even if most EU Member States were in favour of adopting legislation facilitating the use of electronic freight documents, there is a high risk that by legislating unilaterally, each Member State would adopt different requirements for the acceptance of electronic documents. In practice, electronic documents and regulatory information communication which fulfilled the requirements for acceptance in one Member State would not be accepted in others, thus creating barriers within the EU single market. The same applies for banks and insurance companies in the event of accidents or other possible sources of issues that require legal advice.

3. **Delays in diverging national legislation provisions regarding acceptance of electronic transport documents across the Member States**

As indicated also above, each Member State may have a different timeline for the adoption of the e-FTI, thus causing delays on the acceptance of the electronic transport documents by the Member States. This issue could make private companies more reluctant to invest in the digitalization of their processes in order to adopt the e-FTI, since their own Member States may be delayed for years.

4. **Non-uniform Regulations and requirements governing the authorities' side**

The most appropriate level to address the problem and its drivers is therefore the EU level, where a uniform approach to Regulations and requirements for the acceptance of electronic documents and common standards could be set.

5. **Lack of development of interoperable standards (and IT solutions) for the exchange of transport documents and ITS data between businesses and authorities across different modes of transport and different Member States.**

The lack of interoperability among different platforms and IT solutions for data exchange is a well-known issue that is fully covered in Subgroup 2 of the DTLF. It is obvious though, that the lack of interoperable standards for the exchange of transport documents could affect the broad adoption of the e-FTI across EU Member States, since it would be impossible to exchange data between different business and authorities.

6. **Lack of harmonized inspection requirements between and within Member States.**

It is true that there are different inspection requirements between some Member States which cause inconsistencies in data that should be exchanged between each Member State. The lack of such standardized requirements could result in the delayed adoption of the e-FTI Regulation within Member States.

Assessment of potential barriers to the e-FTI implementation

The list of the most significant potential barriers to the e-FTI adoption was included in the questionnaire survey to experts in order to define the level of (negative) impact of each barrier to the implementation of the e-FTI. The participants were requested to rate from a scale from 0 to 100 each barrier with 0 standing for a very low, 50 for a moderate and 100 for a very high (negative) impact. The results are presented in Figure 24.

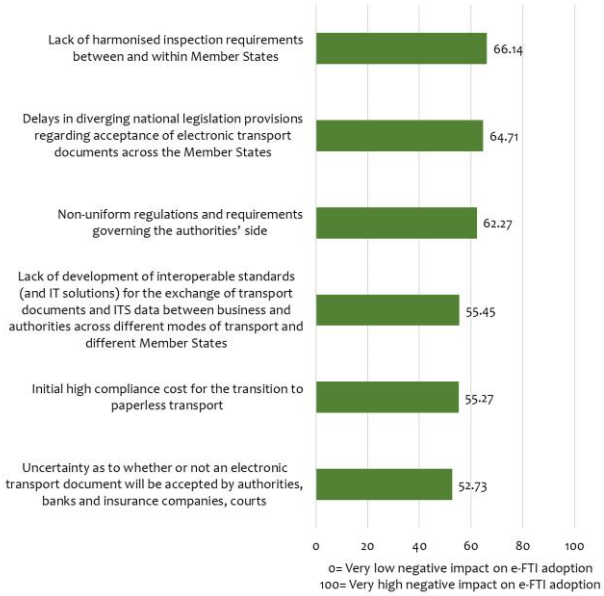

Figure 25: Assessment of the impact of potential barriers to the e-FTI adoption

The main conclusion that emerges from the results of the survey is that all identified barriers are expected to have a significant (above moderate) negative impact on the future implementation of the e-FTI. Among them, the lack of harmonization between member states regarding the inspection requirements, the observed delays in the process of adapting national legislations towards accepting electronic freight documents and the non-uniform Regulations and requirements between authorities are considered by experts to be the most important barriers to the e-FTI adoption. It is worth noting that all three barriers which are expected to have the most negative impact are related to required actions from member states, a fact that reflects the concerns of experts regarding the ability of member states to support the transition in a timely manner.

On the other hand, it is expected that the barrier of the initial high compliance cost for the transition to paperless transport will not be as important, probably considering that the significant advantages deriving from the implementation of e-FTI will motivate companies to invest in the transition.

Finally, in addition to assessing the previously identified barriers, the participants were granted with the option to provide more potential barriers to the e-FTI implementation. In this context, several other potential barriers were suggested and more specifically:

- The resistance of public servants/authorities to the digitalization of their processes.
- The lobbying of forces opposing paperless transport.
- The fact that the e-FTI is compulsory for member states but not for companies which may force the existence of a dual system.
- The current limited scope of the e-FTI.
- The reluctance of some member states to ease competition for social or economic reasons.

6.2.2 Corridor Information Systems (Federated Platforms)

Customers of transport and logistics sectors can have a lot of different requirements based on their specific business, thus causing extreme diversity in services offered by Logistics Service Providers (LSPs). In order to cope with the increased needs of this diversity, they have to offer specialized activities and/or combined services in an attempt to satisfy their customers. The proposed solution of a federative network of platforms will offer interoperability for standardized platform services that support data sharing between different organizations. Although the proposed solution has many clear advantages for organizations, there are also some key implementation barriers that may hamper the wider adoption of this policy.

1. **A possible limited number of platform service providers implementing the federated platforms will cause low competition and high prices thus making them unaffordable for a significant number of smaller companies.**

The objective is for various platforms and solutions to be interoperable and federated in order to cover a large number of transport and logistics companies. However, there is the risk that only a limited number of platform service providers will implement the federated platforms, thus causing low competition and increased costs for the federation. The high initial costs may make the concept unaffordable for a large number of smaller companies, thus delaying the wider adoption of the federated network of platforms within the EU.

2. **Low acceptance by the core players with high volume and/or first mover capabilities will slow down the process of wide implementation.**

It is well known that in transport and logistics sector there are some key players with high volumes and wide coverage across the EU. If these players don't realize the benefits or don't receive any incentives to accept and implement the federated platforms, there is high risk poor rate of acceptance among the sector's companies which will inevitably slow down the wide implementation of the concept.

3. **Resistance to change by companies regarding business processes**

As in the case of any proposed change, there is an increased possibility that companies will be reluctant to change their business processes in order to adapt to the federated platforms. In this case, a solid impact assessment of the proposed solution with quantification of the expected benefits will be needed, in order to convince companies to adapt their business processes to the federated platforms.

4. **Financial or technical inability of organizations to amend their systems in order to implement their local interface for connecting to the federative platforms.**

Any platform participating in the federative platform must be able to provide standardized platform services for data sharing between business processes of different organizations and be interoperable with other platforms for the services it provides to its users. In order for companies to comply with these rules, there is a high need for financial flexibility to pay for the transformation or increased technical expertise from the IT workforce in order to amend systems and implement their local interface for connecting to the federative platforms.

5. **Trust issues regarding security of data.**

A very critical issue for the wider adoption of the federated platforms is trust regarding data security. Trust can be implemented by monitoring and logging services and encrypting data to be shared between platforms. The minimum trust level should be the identity and authentication in order to provide assurance that stakeholders using a platform really are who they claim to be. The existence of trust issues regarding data security could be a serious obstacle for the wide adoption of the federated platforms.

Assessment of potential barriers to the Federated Platforms implementation

As in the case of the e-FTI, the list of the most significant potential barriers to the e-FTI adoption was included in the questionnaire survey to experts in order to define the level of (negative) impact of each barrier to the implementation of the e-FTI. The participants were requested to rate from a scale from 0 to 100 each barrier with 0 standing for a very low, 50 for a moderate and 100 for a very high (negative) impact. The results are presented in Figure 25.

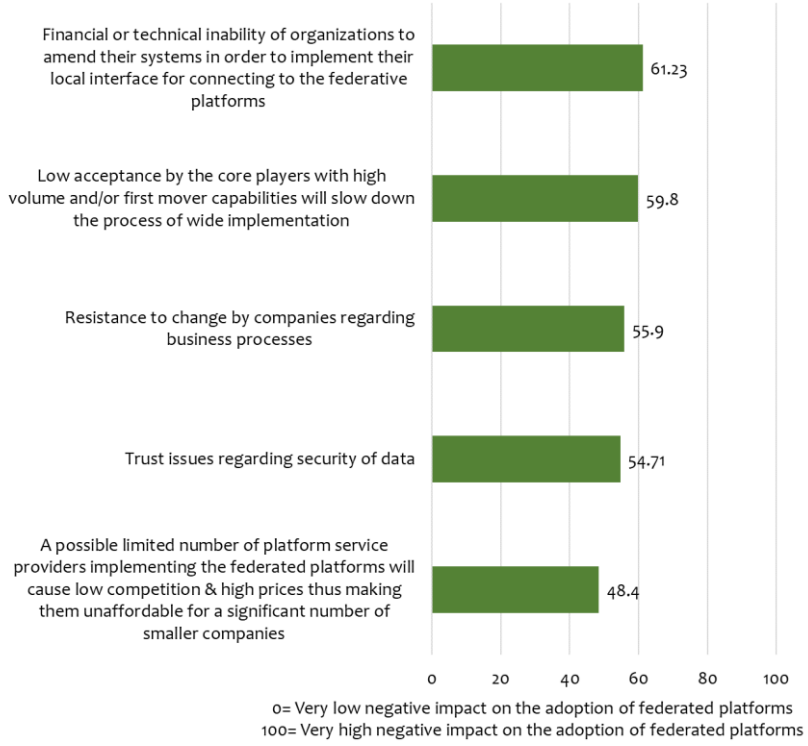

Figure 26: Assessment of the impact of potential barriers to the adoption of Federated Platforms

Similar to the case of e-FTI, all previously identified barriers were assessed by experts as likely to have a significant negative impact on the future implementation of the Federated Platforms. More specifically, the inability of organisations to amend their systems for technical or financial reasons in order to connect to the federated platforms together with the possibility for low acceptance of Federated Platforms by the core players of the market are the two barriers that are considered by experts to be the most important barriers to their adoption.

With regard to the first barrier, it is estimated that it is related also to the financial impacts to companies from the COVID19 pandemic which has affected their investing capability while the second barrier highlights the important role of core players in the success of the initiative and thus the need for additional effort in order to get them involved.

On the other hand, experts do not appear to be concerned to the same level regarding competition issues between platform service providers which can potentially lead to high prices, considering possibly that the market will self-regulate on prices for the provided services. In addition to the suggested barriers, the participants also provided the following potential barriers to the implementation of Federated Platforms:

- The fear of companies for devaluation of their previous investments on digital systems.
- The existence of many important flows that do not need complex interfaces and thus will be reluctant to join federated Platforms, especially if the existing systems allow for commercial brokerage at interfaces between nodes.
- Possible lack of adequate support in the form of training/guidance.

- Possible lack of sustainable business models for the Federated Platforms operators.
- Fear of the public sector for layoffs after the completion of the transition to digitalization.

6.3 Relevance for PLANET WPs and LLs

The first version of this deliverable will serve essentially for the following purposes:

- The selection of impacts to be fed into simulation (see chapters 4.3 and 5.8) should be taken into consideration when designing and developing the simulation models and tools.
- The catalogue and the first list of impacts should be further investigated by the three LLs to validate the first results and to improve the inventory whenever necessary, in particular the analysis of national rules outside Europe.
- The preliminary results should be transmitted to WP4 for first integration and discussion.
- Some of the results should be re-used for the activities on drafting the policy recommendations of PLANET (WP5).

7 Summary and conclusions

The first version of D1.6 on 'Legislation and EU Policy to impact EGTN' addresses the preliminary results of the analysis on the ongoing and forthcoming legislative and policy initiatives that might impact the design and realisation of the EGTN within the PLANET project. The overall activities have been focused on the following main subjects:

1. creating an inventory of all legislative and policy initiatives relevant for the realisation of the EGTN. On the legal aspects, the catalogue has been structured around three components: international, European and national. For the policy, the main source is the current activities of the DTLG subgroups 1 and 2.
2. assessing the impacts of those actions on the creation of the EGTN.

The next sections will point out the main impact elements and barriers for both legislative and policy analysis. These elements are considered as prerequisites for the EGTN realisation.

For the final version (to be submitted at the end of the project) it is expected to include at least the following activities:

- Legislative initiatives: to enhance the current inventory with supplementary documents (namely by covering the national level), to pursue the impact assessment on the already identified references (for example the expected new versions of the TEN-T Regulation, RFC Regulation, CT Directive) and to perform the evaluation of the newly identified documents, to provide detailed requirements for the EGTN ecosystem. External experts will be invited to contribute to the extension of the catalogue and to the impact assessment.
- Policy initiatives: to report on all DTLF activities, to analyse the impacts of the expected delegated and implementing acts related to the eFTI and to further scrutinise the design and implementation of the corridor information systems. External experts will be contacted to support the project partners in this task.
- For both topics, expert panel webinars will be organised to present and discuss the results. Liaison with all LLs will be ensured.

7.1 Legislative view

The aim of the chapter 4 of the current deliverable is to analyse all potential legislative initiatives that might impact the design and realisation of the EGTN. In this part of the document, the most critical components will be pointed out as the essential requirements of the EGTN. Without these elements, the EGTN will not developed under solid foundations and would be therefore not considered as enough stable for the next decades.

For all three dimensions of the EGTN (infrastructure, technological and governance), the following elements are considered as critical for the EGTN:

- **Revision of TEN-T guidelines**: The revision of the TEN-T Guidelines Regulation offers an ideal opportunity for the European legislator to enact the changes needed on the European Union level and to integrate more elements regarding intermodality compliance. The fulfilment of the envisioned modal shift to achieve the decarbonisation objectives of the EU transport sector requires the following changes to the TEN-T Guidelines Regulation: (1) clarification of the TEN-T technical parameters for the railway infrastructure, (2) review of the railway line codification for the 4-meter loading gauge, (3) introduction of parameters to guide the upgrading of transhipment terminals and (4) Introduction of the "freight preferred railway line" category.

- **Revision of the RFC Regulation**: the planned revision should include additional requirements regarding shortfalls like transparency (reporting, one-stop-shop websites, clear and univocal KPIs), enhanced organisation and governance structures (role of corridor managing directors, composition of the RAGs and TAGs, public meetings) and improved tasks and competences (adequate capacities, quick win projects, traffic management).

- **Single European Railway Area**: a Single European Railway Area means that, in principle, any European railway undertaking may operate services on any rail network in any country of the European Union. In recent years, the EU has adopted four railway packages which aim to open the railway market to competition, increase the interoperability of national railway systems and define the framework for a Single European Railway Area. The EGTN will only be demonstrated its benefits with the full realisation of a harmonised European infrastructure network (for example parameters such as train length, axel load, speed…).

- **CT Directive**: Combined Transport provides the most efficient link between road and the other sustainable modes of surface transport like electric rail and the waterborne solutions. While the demand to transport conventional cargo is decreasing, the unabated growth of the surface freight transport market is fuelled by processed goods typically carried in trucks. The European Union must reverse the trend under these circumstances and double, even triple the tonne-kilometre performance of non-road modes. The intermodal system of freight transport will need to play a very substantial role in this transformation, which is only possible if transport policymakers ensure that the rail infrastructure is adjusted to the needs to intermodality and its capacity adequately extended. The new proposal is expected to be drafted by the Commission in the course of the fourth quarter of 2021.

- **Full digitalisation of transport-related documents and creation of adequate document exchange platform**: legislative initiatives such as CIM, SMGS and TIR clearly support the aim to digitalise land transport modes such as road and rail by proposing digital measures within and outside the European Union. The realisation of EGTN will be successful under the condition that all these initiatives are somehow coordinated, enhanced and aligned.

7.2 Policy view

In the present document, the policy initiatives which are expected to facilitate the evolution of the current EU transportation network towards the EGTN vision and in that sense can be considered as prerequisites for achieving its defining attributes are presented. These policies are included in the recently published document for the Sustainable and Smart mobility strategy together with proposed new or revised legislation, aiming to make the EU transportation network greener and more technology enabled while increasing its resilience and inclusiveness. These objectives are fully aligned with the EGTN vision and thus the strategy is expected to have a significant impact on its realisation. Moreover, three other specific policy initiatives which are considered key to the EGTN realisation are analysed, namely the policy for Sustainable Finance and the policies deriving from the Digital Transport and Logistics Forum regarding the implementation of paperless transport (e-FTI) and the corridor information systems (federated platforms).

The Sustainable Finance policy has the objective of involving the private sector in the funding of sustainable activities and infrastructure in order to complement public funding in the effort to reach the objectives emerging from the Green Deal. It includes the EU taxonomy for sustainable activities classification system, a tool which is developed to support the implementation of this policy, through establishing a list of environmentally sustainable economic activities which include the activities from the transport sector. In this context and despite the fact that the Sustainable Finance policy does not oblige private companies to align their investment to the EU taxonomy, it is expected to have a significant impact on the private funding on green infrastructure and technologies. This will lead to the development of a transportation network more

environmentally sustainable and technologically driven compared to the existing TEN-T thus helping to achieve the sustainability and innovation attributes of the EGTN.

With regard to the DTLF policies, their objectives are to achieve paperless freight transport for all transport modes and the establishment of a federated network of platforms, both of which are related to the digitalisation of the transport sector.

The implementation of the e-FTI Regulation is expected to facilitate the movement of goods within the EU through supporting the efficient exchange of information for all modes of transport to cross border and multimodal processes while having the prospect of being widely accepted and implemented also globally, on corridors reaching the EU. In this context, the policy for the electronic freight transport information exchange is expected to have a significant impact on the economic efficiency of operations on the TEN-T while it will also facilitate the integration of EU corridors to the global corridors in alignment to the requirements for economic sustainability and integration attributes of the EGTN. Furthermore, paperless transport is also expected to have an impact on the carbon footprint of transportation leading to a more environmentally sustainable network in alignment to the sustainability attributes of the EGTN vision.

The establishment of a network of Federated Platforms is expected to facilitate the seamless data sharing and thus the end-to-end visibility of the supply chain through the development of a basic cross-modal data semantics that will be adopted (specialized) and implemented by all the supply chain stakeholders. In this context, it is expected that the Federated Platforms will have a positive impact on the greening of the supply chain and also to the resilience of the transport network by facilitating the moving the goods by and between different carriers and transport modes, which are crucial attributes to realizing the EGTN vision. Moreover, the existence of a federated network of platforms covering the EU will make easier their future interoperability with platforms from outside EU and along global corridors and thus contribute to achieving the integration attribute of EGTN.

However, the implementation of policies often contradicts constraints associated with the existing conditions in the sectors in which they apply. These constraints may concern all relevant stakeholders such as the private and public sector and the governments of member states. For example, in the case of private companies, financial issues affecting the investment capabilities of private companies especially after the COVID19 pandemic and the innate resistance to the change of established business practices are important barriers to policies especially when policies are implemented on voluntarily basis. On the other hand, the possible inability of some governments to act in a timely manner in order to adapt their national legislation in alignment to new policy requirements and the difficulties in coordination among member states regarding the setup of common requirements are two examples of barriers coming from the governance level.

Therefore, it becomes clear that there is a need for mapping the possible barriers of the policies and link them to possible solutions. It is imperative to provide guidance, motives and/or the necessary supporting legislative framework to alleviate barriers in order for policies and their outcomes to be able to be implemented in their full extend and in a timely manner so as to have the expected benefits on the EGTN development. Moreover, all relevant stakeholder who will have a key role in the implementation of a policy must be well informed of the expected impacts and benefits of this policy and also of the risks.

Finally, another important aspect of policy implementation that should be taken in account is related to the evaluation of the policy effectiveness regarding the objectives it aims to achieve. The evaluation process will provide the required information in order to possibly revise and re-implement policies to enhance their effectiveness. For this reason, it is imperative to develop a specialised set of indicators for each case of policy implementation, in order to be able to evaluate the level of impacts in relation to the initial expectations and over time. These indicators should be related to the specific policy objectives of each policy and the attributes of EGTN which it is expected to impact. However, it should be noted that defining these indicators will be a challenging task because of possible overlapping with the impact of other initiatives/measures applied during the same period of time.

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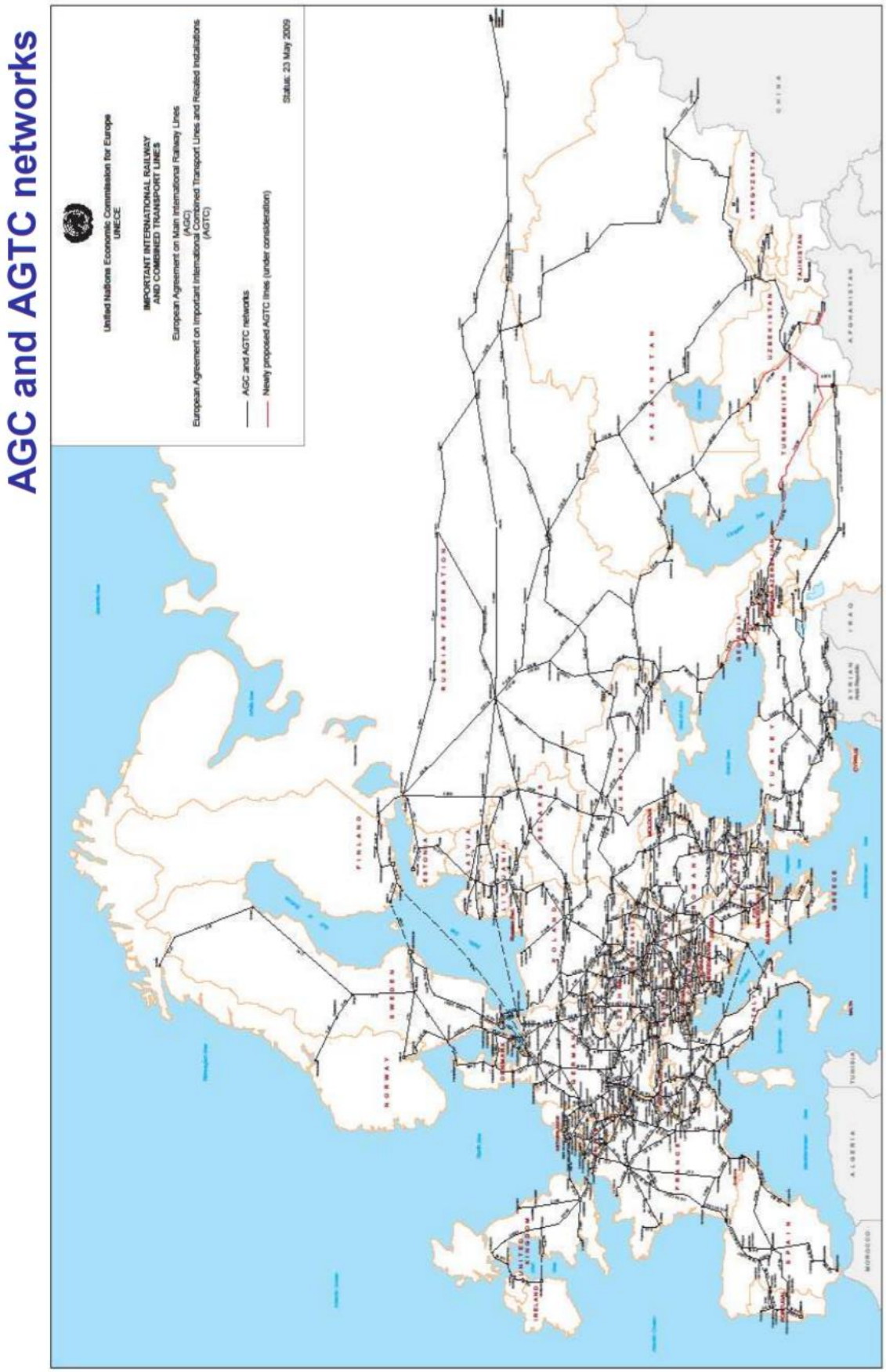
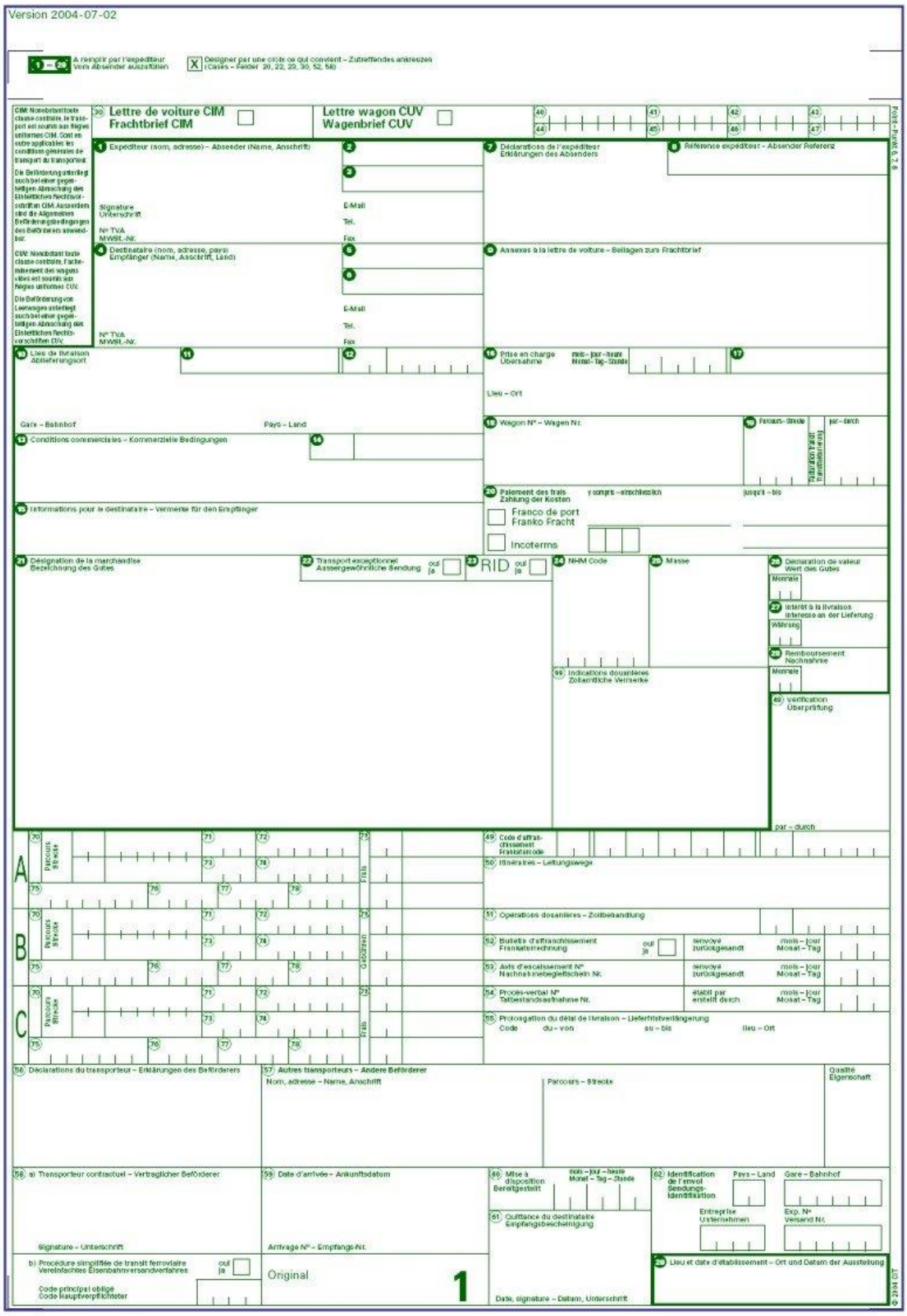
Annex I: ACG and AGTC networks



Annex II: CIM Consignment note



Annex III: Questionnaire of DTLF survey to experts

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

Information about the project

PLANET – Progress towards Federated Logistics Through The Integration Of TEN-T into A Global Trade Network

Funded under: H2020-EU.3.4. SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

Project description

The PLANET (Progress towards Federated Logistics Through the Integration Of TEN-T into A Global Trade Network) is a Horizon 2020 project funded by the European Commission aiming at addressing the challenge of assessing the impact of emerging global trade corridors on the TEN-T network and ensuring effective integration of the European to the Global Network by focusing in two key R&D pillars:

- A Geo-economics approach, modelling and specifying the dynamics of new trade routes and its impacts on logistics infrastructure & operations, with specific reference to TEN-T, including peripheral regions and landlocked developing countries;
- An EU-Global network enablement through disruptive concepts and technologies (IoT, Blockchain and PI, 5G, 3D printing, autonomous vehicles /automation, hyperloop) which can shape its future and address its shortcomings, aligned to the DTLF concept of a federated network of T&L platforms.

PLANET goes beyond strategic transport studies, and ICT for transport research, by rigorously modelling, analysing, demonstrating & assessing their interactions and dynamics thus, providing a more realistic view of the emerging T&L environment. The project employs 3 EU-global real-world corridor Living Labs including sea and rail for intercontinental connection and provides the experimentation environment for designing and exploiting future PI-oriented Integrated Green EU-Global T&L Networks [EGTN]. To facilitate this process, PLANET delivers a Symbiotic Digital Clone for EGTNs, as an open collaborative planning tool for TEN-T Corridor participants, infrastructure planners, and industry/technology strategists. PLANET also delivers an Active Blueprint and Road Map, providing guidance and building public & private actor capacity towards the realisation of EGTNs, and facilitating the development of disadvantaged regions. The project engages major T&L stakeholders, contributing to both strategy and technology and (importantly) has the industry weight and influence to create industry momentum in Federated Logistics and TEN-T's integration into the Global Network.

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

Participant Information Sheet

1. Why am I participating?

You have been chosen as an expert to provide your opinion regarding the impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN].

2. Which is my role in the project?

To provide your opinion through a questionnaire survey.

3. Information about the data to be collected

The data from your contribution together with the corresponding data from other experts will be used for statistical analysis in order to form a view on the expected impacts of the potential future EU policy actions to the development of the Integrated Green EU Global T&L Networks [EGTN].

4. Which treatment will I have for my personal data?

No personal data will be stored.

5. Benefits of taking part

You will have the opportunity to gain knowledge about an innovative project related to the future of TEN-T and the implementation of disruptive concepts and technologies (IoT, Blockchain and PI, 5G, 3D printing, autonomous vehicles /automation, hyperloop) which can shape its future and address its shortcomings.

6. Sharing of results

The sharing of the survey findings with the participants will be realised through the dissemination of the project results according to its time plan. Furthermore, the research findings will be broadly shared through journal publications and conferences.

7. Reference contacts

If you have any questions you may contact Mr. Orestis Tsolakis, Research Associate at the Centre for Research and Technology

Hellas (CERTH)/ Hellenic Institute of Transport (HIT) - email: ortsolakis@certh.gr

8. Further information

For further details please refer to the PLANET website at: https://www.planetproject.eu/

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

Certificate of Consent

Please check the following:

- ☐ I confirm that I have received the Participant Information Sheet
- ☐ I know the purpose of collecting the data and its processing
- ☐ I voluntarily participate in this research

Please select:

- ☐ **I agree** to take part in the survey
- ☐ **I do not agree** to take part in the survey

Participant Information

Which of the following best describes the type of organisation you currently work for?

- ☐ Academia or Research institute
- ☐ Public Authority
- ☐ Association
- ☐ Consultancy
- ☐ Private company of the logistics industry
- ☐ Other (please specify): …….

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART I:

DTLF policy adoption and impacts on logistics processes

Introduction

The Digital Transport & Logistics Forum (DTLF) is a group of experts that brings together stakeholders from different transport and logistics communities, from both the private and the public sector, with a view to build a common vision and road map for digital transport and logistics. The DTLF supports the EC in implementing 100% digital information exchanges and a shared transport and logistics dataspace. More information can be found on: https://www.dtlf.eu/

To accomplish the abovementioned goal, the DTLF Subgroup 1 contributes to the development of the implementation rules of the new EU Regulation on electronic exchange of freight transport information (e-FTI). e-FTI Regulation establishes a legal framework for road, rail, maritime and air transport operators to share information with enforcement authorities in an electronic format. The target of e-FTI is to develop a single electronic document that includes all necessary requirements along the supply chain from economic operators and competent authorities in relation to the transport of goods within EU.

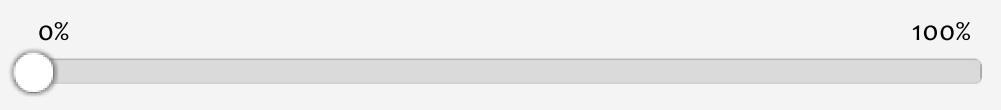
The overall objective of DTLF Subgroup 2 – Corridor Information Systems aims to create a common understanding and solutions for data sharing in supply and logistics that are a basis for innovation and cost reduction, and contribute to societal challenges like safety, security, and sustainability. The initiative will contribute to the establishment of a viable federated network of platforms for data sharing in the freight transport and logistics domain at EU level (and beyond). The target is to design and validate a federated network of platforms concept to enable data sharing in the logistics chain while providing interoperability and harmonisation between individual platforms.

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

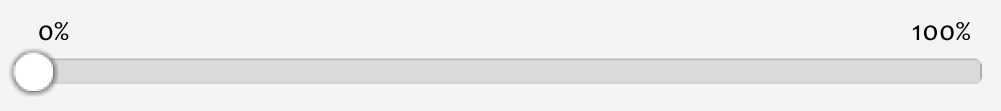
PART I:

DTLF policy adoption

What average rate of adoption do you expect that the electronic exchange of freight transport information (e-FTI) regulation will have in 2030?



What average rate of adoption do you expect that the federated network of platforms will have in 2030?



Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

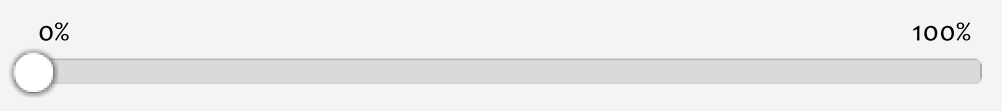
PART I:

DTLF policy impacts on logistics processes

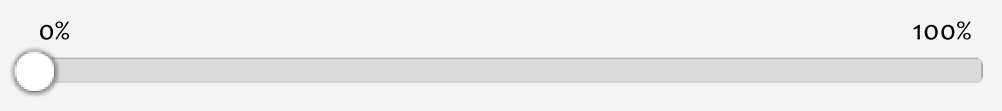
SG1: ELECTRONIC FREIGHT TRANSPORT INFORMATION

By the year 2030, which do you expect to be the level of achieved impact for businesses from the implementation of the regulation for the electronic Freight Transport Information, regarding:

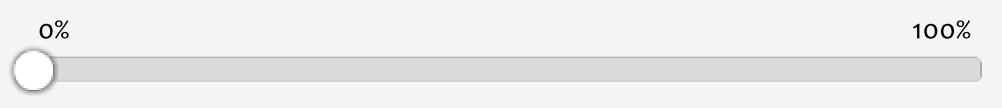
Administrative cost savings



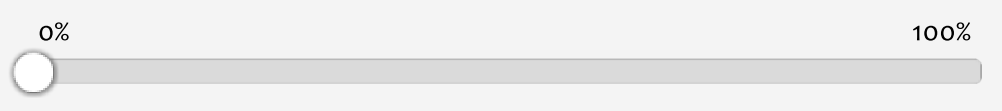
Saving of work hours on administrative procedures



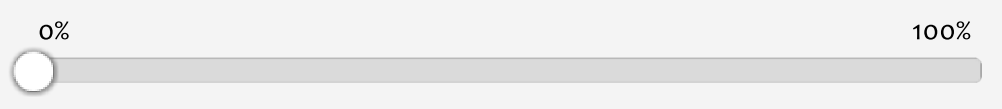
Reduction of environmental impact (CO2 emissions)



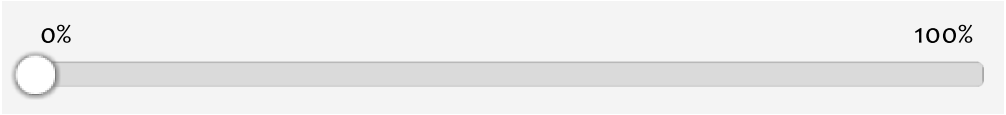
Better rule enforcement (risk-analysis based checks)



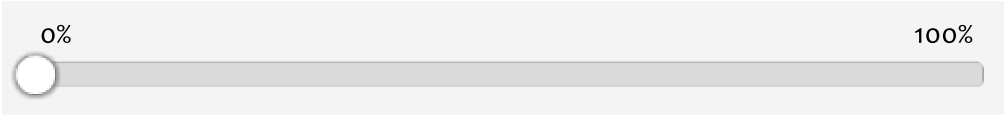
Facilitation of policy making (availability of better statistics)



Business opportunities for IT companies



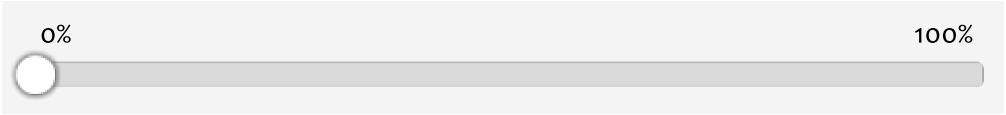
Reduction in fraud/corrupt practices



Data accuracy

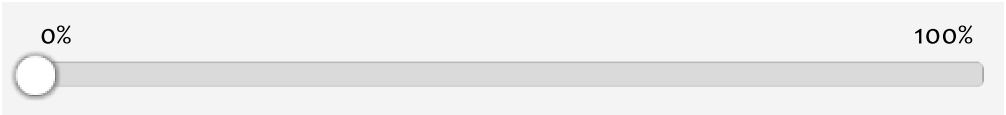
Other [1] (please specify): ……

If you specified “other”, please rate it:



Other [2] (please specify): ……

If you specified “other”, please rate it:



Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

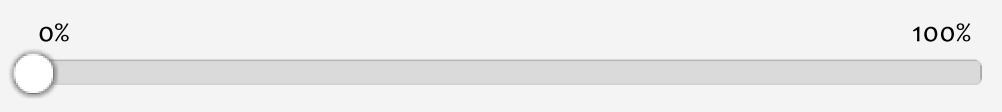
PART I:

DTLF policy impacts on logistics processes

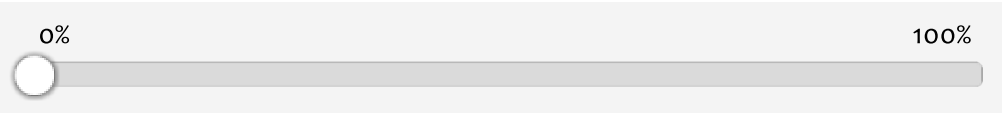
SG2: FEDERATED NETWORK OF PLATFORMS

By the year 2030, which do you expect to be the level of achieved impact to the following business/management processes, by the implementation of the federated network of platforms:

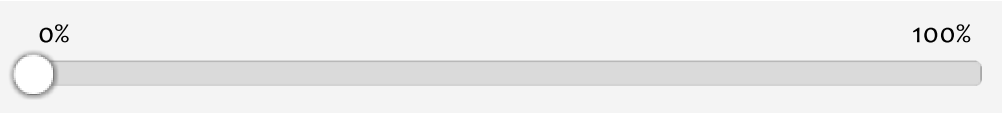
Transparency/visibility regarding their product flow for shippers/consignees



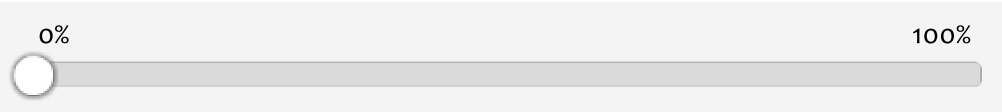
Visibility of alternative multimodal transport solutions for logistics service providers



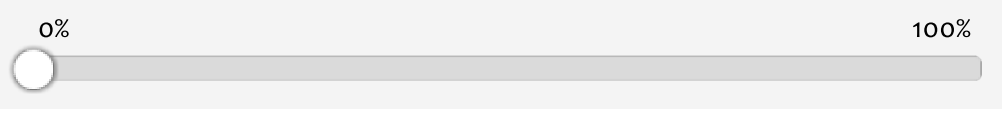
Visibility of demand patterns for carriers



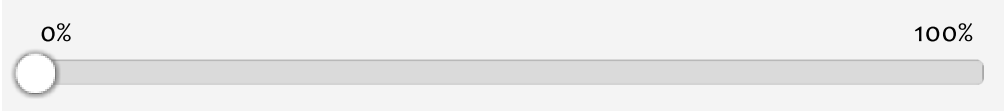
Facilitation of the work of law enforcement authorities such as customs and other inspection authorities



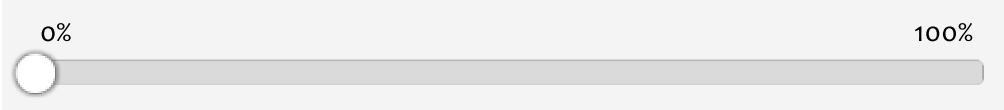
Optimal prediction and coordination of traffic flows for infrastructure providers to timely prepare investments



Integration into capacity and production planning systems for multimodal transportation networks

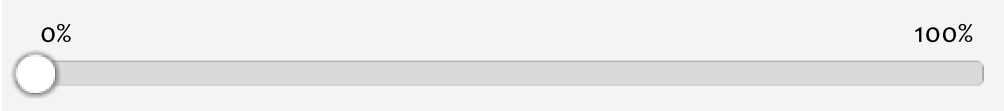


Effective integration of multimodal transport systems to the production systems of multinational companies



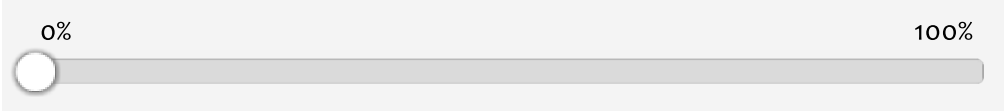
Other [1] (please specify): ……

If you specified “other”, please rate it:



Other [2] (please specify): ……

If you specified “other”, please rate it:



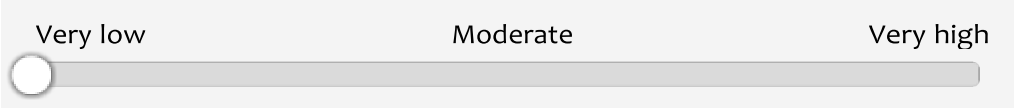
Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART II:

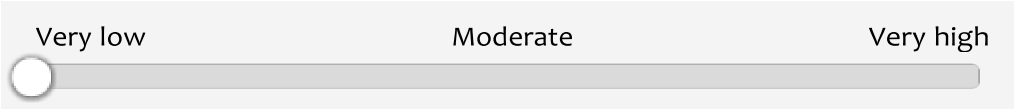
Barriers in the adoption of DTLF policy

Please state the degree to which the following possible barriers are expected to negatively affect the wide adoption of the DTLF policy regarding electronic Freight Transport Information (e-FTI):

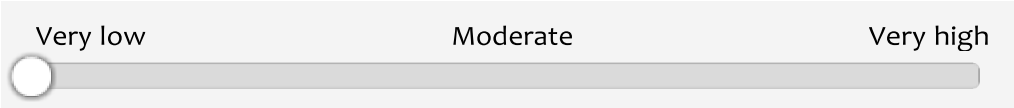
Initial high compliance cost for the transition to paperless transport



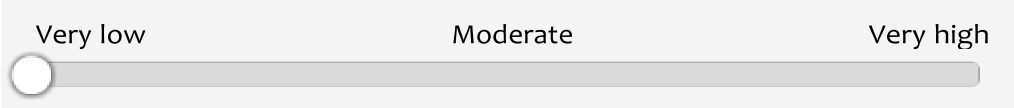
Uncertainty as to whether or not an electronic transport document will be accepted by authorities, banks and insurance companies, courts



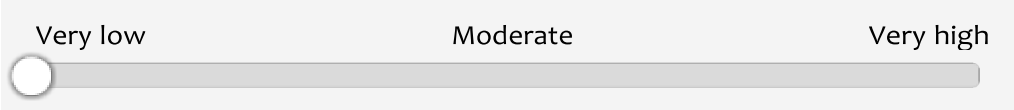
Delays in diverging national legislation provisions regarding acceptance of electronic transport documents across the Member States



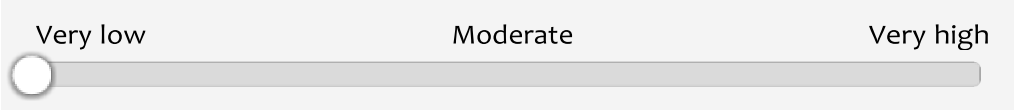
Non-uniform regulations and requirements governing the authorities' side



Lack of development of interoperable standards (and IT solutions) for the exchange of transport documents and ITS data between business and authorities across different modes of transport and different Member States

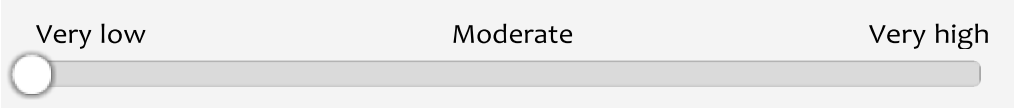


Lack of harmonised inspection requirements between and within Member States



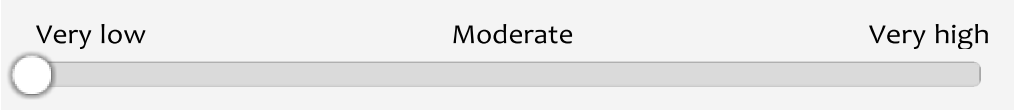
Other [1] (please specify): ……

If you specified “other”, please rate it:



Other [2] (please specify): ……

If you specified “other”, please rate it:



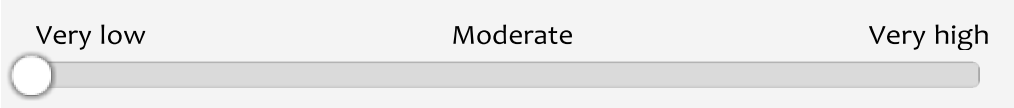
Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART II:

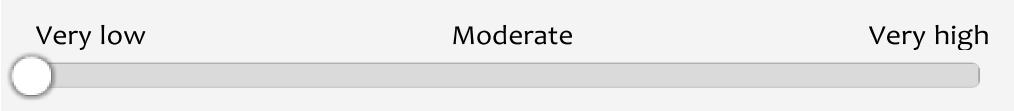
Barriers in the adoption of DTLF policy

Please state the degree to which the following possible barriers are expected to negatively affect the wide adoption of the DTLF policy regarding the Federated network of platforms:

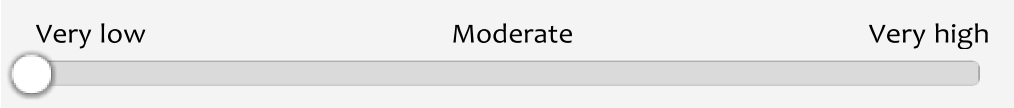
A possible limited number of platform service providers implementing the federated platforms will cause low competition & high prices thus making them unaffordable for a significant number of smaller companies



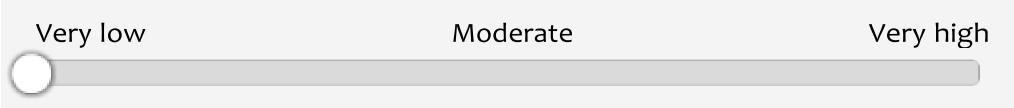
Low acceptance by the core players with high volume and/or first mover capabilities will slow down the process of wide implementation



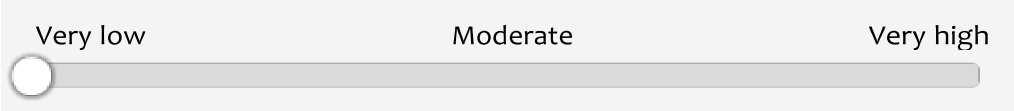
Resistance to change regarding business processes



Financial or technical inability of organizations to amend their systems in order to implement their local interface for connecting to the federative platforms

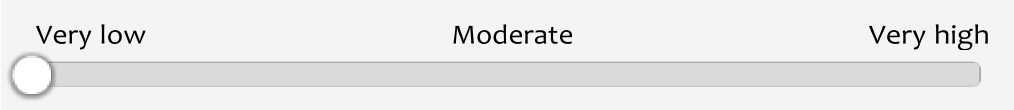


Trust issues regarding security of data



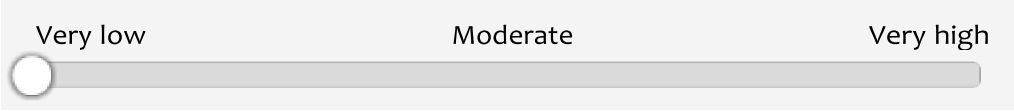
Other [1] (please specify): ……

If you specified “other”, please rate it:



Other [2] (please specify): ……

If you specified “other”, please rate it:



Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART III:

DTLF policy impact on EGTN attributes

Introduction

The Integrated Green EU-Global Transport and Logistics Networks (EGTN) is the realisation of the PLANET vision for advancing the European Commission's strategy for Smart, Green and Integrated Transport and Logistics by efficiently interconnecting infrastructure (TEN-T, Rail-Freight Corridors) with geopolitical developments (e.g. future New Silk Road and emerging trade routes).

PLANET envisions the EGTN as the future of the TEN-T, a resilient network integrated to the Global Network which makes use of physical and digital infrastructure, enabled by (disruptive) transport & logistics concepts and technologies and facilitating operational excellence for customers and external stakeholders while ensuring equitable inclusivity of all participants and the prosperity of nations.

Based on the above, the EGTN has the following attributes:

- **Geo-economics awareness:** EGTN is aware of the geo-economics aspects (regionalisation of production, new TEN-T entry points, private investments etc.) driving the new routes development, and in this context considers three new trade routes and their flows to/from Europe (*the OBOR routes, the Arctic route and the International North-South corridor*) and takes into account the impact these routes will have on the future development of the TEN-T.
- **Innovation:** EGTN wants to take advantage of the potential of innovative logistics concepts (e.g. PI) and enabling technological innovations (Industry 4.0, blockchain, IoT, 3D printing, etc.) in its operation.
- **Impact:** EGTN foresees to be more economically, environmentally and socially sustainable than the existing TEN-T through the implementation of the PI concept and its enabling innovative technologies.
- **Integrated:** EGTN achieves a high level of integration with the global network both in terms of hard & soft infrastructure.
- **Inclusive:** EGTN is accessible to disadvantaged regions, supporting the development of workforce skills & knowledge.

Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART III:

DTLF policy impact on EGTN attributes

SG1: ELECTRONIC FREIGHT TRANSPORT INFORMATION

Based on the description of the EGTN and its attributes presented above, please state your opinion regarding the following statements:

The regulation for electronic Freight Transport Information (e-FTI) will affect the ability of EGTN to capture freight flows development caused by geo-economic parameters (e.g. regionalisation of production and the development of new entry points to the TEN-T) considering them in improving network operations and decision making for infrastructure development, new entry points development etc.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

If you agree, please state the level of impact:

Very negative impact 0 Very positive impact ☐

The e-FTI regulation will have an impact on the resilience of EGTN corridors through multimodality facilitation.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

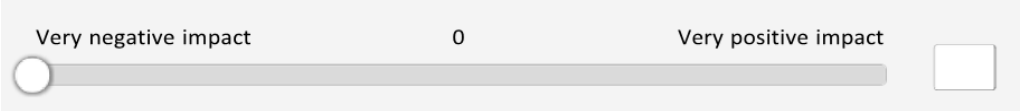
If you agree, please state the level of impact:

Very negative impact 0 Very positive impact ☐

The e-FTI regulation will affect the ability of EGTN to secure a minimum level of accessibility to disadvantaged and remote regions of EU.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

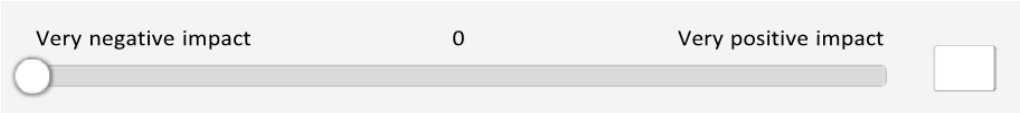
If you agree, please state the level of impact:



The e-FTI regulation will affect the ability of EGTN to adapt corridor capacity in order to respond to changes in demand for transport.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

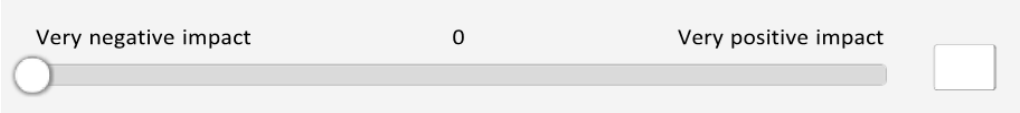
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in the implementation of the Physical Internet concept (PI containers, PI nodes, PI moves etc.) to corridors of the EGTN.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

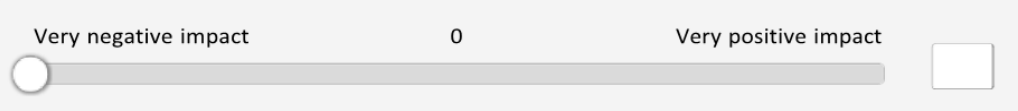
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in introducing and exploit innovative technologies (Blockchain, IoT, AI, 3D printing etc.) in logistics operations on the EGTN.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

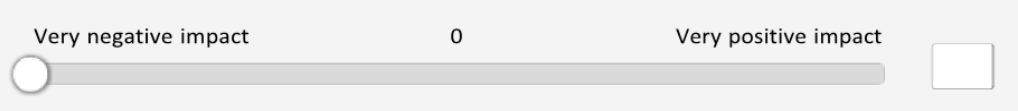
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in the carbon footprint of logistics operations on the EGTN through the visibility increase allowing for efficiency (e.g. better use of resources) and continuous monitoring and environmental assessment of operations.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

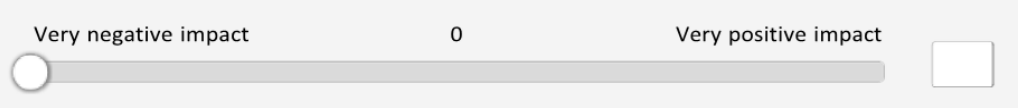
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in social sustainability across EU, promoting social equity regarding employment opportunities in the Transport and Logistics sector across EU and along EGTN, including disadvantaged regions.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

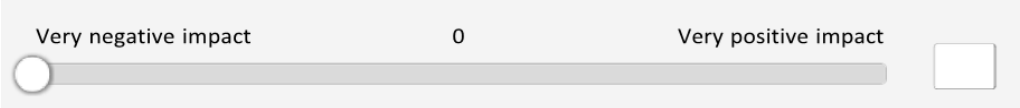
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in the level of economic sustainability and efficiency of logistics operations on the EGTN in terms of resource and labour usage and transport & logistics cost.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

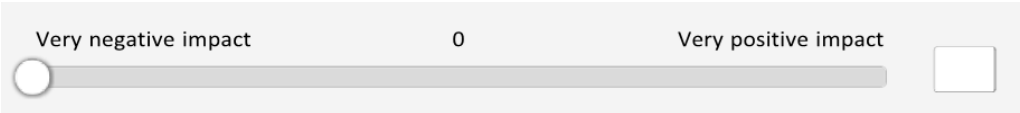
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in the efficiency of processes (e.g. customs clearance) and the seamless transportation of goods across borders during global logistics operations and along EGTN global corridors.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

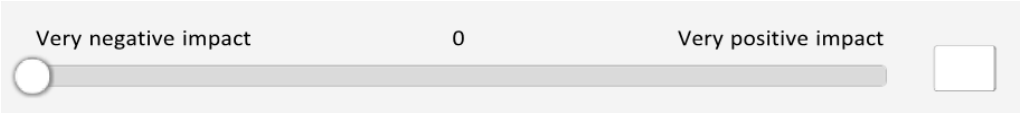
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in the interoperability of rail infrastructure & processes across borders along EGTN global corridors.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

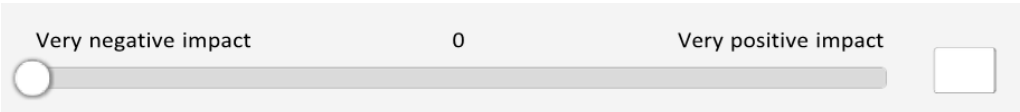
If you agree, please state the level of impact:



The e-FTI regulation will have an impact in data availability of the transport and logistics industry operations, enabling rational planning of EGTN, efficient monitoring of infrastructure and services and fair development of TEN-T, decreasing inequities among regions.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

If you agree, please state the level of impact:



Assessment of impact of the potential future EU policy actions to the development of the Integrated Green EU-Global T&L Networks [EGTN]

PART III:

DTLF policy impact on EGTN attributes

SG2: FEDERATED NETWORK OF PLATFORMS

Based on the description of the EGTN and its attributes presented above, please state your opinion regarding the following statements:

The Federated Network of Platforms will affect the ability of EGTN to capture freight flows development caused by geo-economic parameters (e.g. regionalisation of production and the development of new entry points to the TEN-T) considering them in improving network operations and decision making for infrastructure development, new entry points development etc.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

If you agree, please state the level of impact:

Very negative impact 0 Very positive impact ☐

The Federated Network of Platforms will have an impact on the resilience of EGTN corridors through multimodality facilitation.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

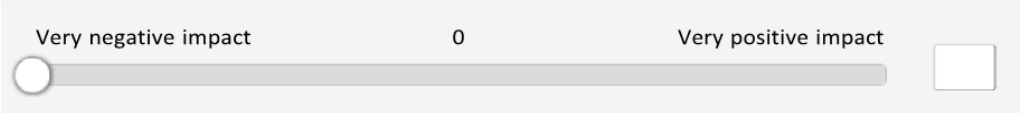
If you agree, please state the level of impact:

Very negative impact 0 Very positive impact ☐

The Federated Network of Platforms will affect the ability of EGTN to secure a minimum level of accessibility to disadvantaged and remote regions of EU.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

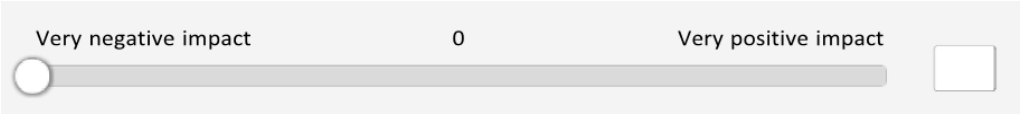
If you agree, please state the level of impact:



The Federated Network of Platforms will affect the ability of EGTN to adapt corridor capacity in order to respond to changes in demand for transport.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

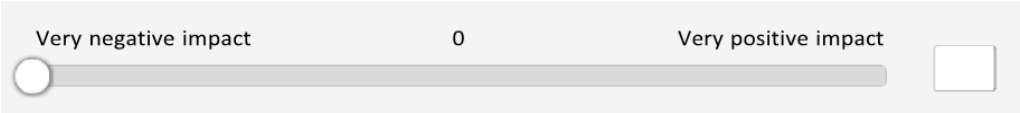
If you agree, please state the level of impact:



The Federated Network of Platforms will have an impact in the implementation of the Physical Internet concept (PI containers, PI nodes, PI moves etc.) to corridors of the EGTN.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

If you agree, please state the level of impact:

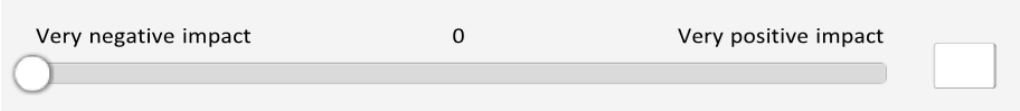


The Federated Network of Platforms will have an impact in introducing and exploit innovative technologies (Blockchain, IoT, AI, 3D printing etc.) in logistics operations on the EGTN.

- ☐ Agree

- [ ] Disagree
- [ ] I don't know

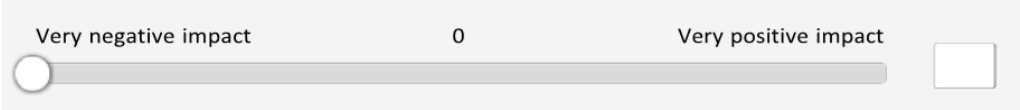
If you agree, please state the level of impact:



The Federated Network of Platforms will have an impact in the carbon footprint of logistics operations on the EGTN through the visibility increase allowing for efficiency (e.g. better use of resources) and continuous monitoring and environmental assessment of operations.

- [ ] Agree
- [ ] Disagree
- [ ] I don't know

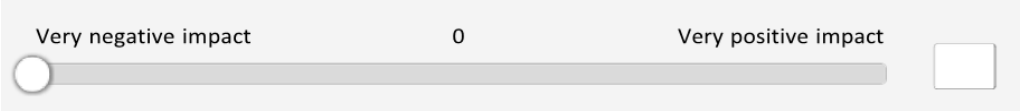
If you agree, please state the level of impact:



The Federated Network of Platforms will have an impact in social sustainability across EU, promoting social equity regarding employment opportunities in the Transport and Logistics sector across EU and along EGTN, including disadvantaged regions.

- [ ] Agree
- [ ] Disagree
- [ ] I don't know

If you agree, please state the level of impact:



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- [ ] Agree
- [ ] Disagree
- [ ] I don't know

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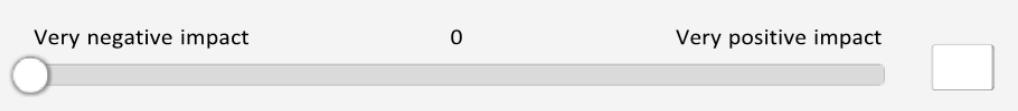
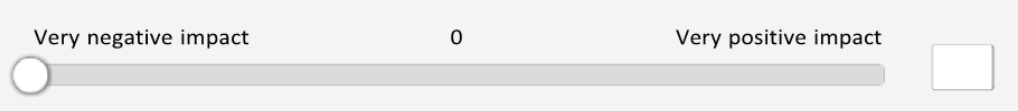


The Federated Network of Platforms will have an impact in the efficiency of processes (e.g. customs clearance) and the seamless transportation of goods across borders during global logistics operations and along EGTN global corridors.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

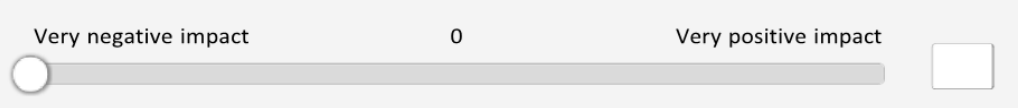
If you agree, please state the level of impact:



The Federated Network of Platforms will have an impact in the interoperability of rail infrastructure & processes across borders along EGTN global corridors.

- ☐ Agree
- ☐ Disagree
- ☐ I don't know

If you agree, please state the level of impact:



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- ☐ Disagree
- ☐ I don't know

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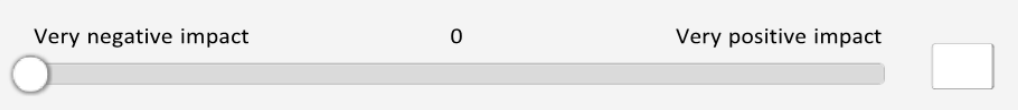
Very negative impact
0
Very positive impact